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THROWING OFF THE SHACKLES:
THE EMERGENCE OF THE SOVIET UNION
INTO THE ARENA OF WORLD TRADE

by

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The Soviet Union has broken away from their traditional autarkic views and entered the arena of world trade. Initially focusing on and enjoying the political and economic benefits of trade with the West, the Soviets are not gradually enlarging their trade activity and shifting their attention to Third World markets for political and economic gain. It is the intent of the Soviet leadership to form a more operable and

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Throwing Off the Shackles: The Emergence of the Soviet Union Into the Arena of World Trade

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ABSTRACT

The Soviet Union has broken away from their traditional autarkic views and entered the arena of world trade. Initially focusing on and enjoying the political and economic benefits of trade with the West, the Soviets are now gradually enlarging their trade activity and shifting their attention to Third World markets for political and economic gain. It is in the intent of the Soviet leadership to form a more operable and las ng extension of power through a stable triangle of influence, with Marxist/Leninist ideology and political structure on one side, military support and arms supply on the other side, on an ever-expanding, stabilizing economic base. This study examines the economic motivati and viability of these Soviet intent ons.

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I. INTRODUCTION

A. ECONOMIC VS. MILITARY CONFRONTATION

As the weapons of war have become more and more destructive in nature, to the point that their use is almost unimaginable, direct military confrontation of the superpowers has become less likely. With this superpower stand-off, conflict and competition between the United States and the Soviet Union will turn increasingly toward economic, vice direct military, confrontation. This trend will accelerate as the supplies of unrecoverable natural resources are inevitably depleted and the Eastern bloc penetrates more deeply into world trade.

In 1957, Soviet Premier Nikita Khrushchev declared war on the United States, not a military confrontation but rather an economic confrontation. He said, "We declare war upon you...in the peaceful field of trade. We declare a war. We will win over the United States. The threat of the United States is not the ICBM, but in the field of peaceful production." [Ref. 1: p. 89] If the further and main competitive arena of the superpowers is to be based on economic strength, our trade policy application with the Eastern bloc must include an economic evaluation as well as a military evaluation of the effects of such trade. Of equal importance is the full understanding of the intentions and effects of Soviet world trade.

It is only within the last thirty years that the Soviet Union has developed the capabilities to extend the slightest credible economic influence through trade and aid. Within the last 15 years, there has been an accelerated decline in the perceived Soviet military threat to Western Europe encouraging the continuation of regional détente, which equates to increased East-West European trade. It is arguable whether there has ever been a real Soviet military threat to the Third World. Economic development rather than Soviet military encroachment is of much greater immediate concern to most world leaders.

Less than 15 years ago, in the early 1970's, the Soviet Union fully recognized the economic and political benefits of world trade and broke from their traditional autarkic views [Ref. 2: p. 18]. Entering the arena of world trade in search of much needed technology and grain, the Soviets initially focused on and enjoyed the benefits of trade with the West. Moscow is now gradually enlarging trade activities and shifting their attention to Third World markets to obtain both economic and political gain.

B. SOVIET TRADE MOTIVATIONS

The Soviet Union's entry into world trade is primarily driven by three complementary factors. First, and most importantly, is the Soviet Union's inherent need to continuously expand its influence and power, which is dictated by traditional Czarist Russian expansionism, and supported today

by Communist ideology and doctrine. The expansion of power and influence is realized via three basic channels. These three basic expressions of state power and influence are exercised through state diplomacy, through the military and through economics. While in the past the strength and importance of economic involvement has been beyond the grasp of the Kremlin's leadership, it now plays an ever increasing role in their strategy of world dominance.

The second complementary factor driving the Soviets toward world trade lies in the pure economic benefit of trade. The Kremlin leadership has, for over 15 years, witnessed the economic and political benefit of trade. This has been evidenced by the growth and development of East-West European trade with the resultant regional continuation of détente. The Soviet Union's more recent attempts to expand trade with the Third World can be closely coupled with the increasing costs involved in the extraction of domestic natural resources, and the need to open markets for Soviet semifinished and finished products.

Finally, the Soviet Union's entrance into Western and Third World markets could eventually place additional competitive strains on the United States and the entire free market system. With rising protectionist sentiment throughout many sectors of the free market system, continuing emergence of the Eastern bloc command economies into non-traditional markets could spark trade wars debilitating the free market system. The inevitable consequence of such action

would be the reduction of U.S. power and influence, with minimum Soviet costs in a virtually risk-free environment.

While the Soviet Union remains as one of the world's most self-sufficient economies, it is able to enter and develop world markets selectively, content with the knowledge that it is not presently dependent on those markets. At the same time, the Soviets are well aware of the almost total dependence of the United States on many Third World markets [Ref. 3: p. VII]. Lenin viewed the fundamental weakness of the capitalist system in its dependence on the colonies and developing countries. The road to London stretched through New Delhi and Peking in 1920. Today, in the neo-colonial period, the road to Washington stretches through South Africa, Saudi Arabia, the Philippines, Venezuela, Panama, Mexico, etc.

C. STABILIZING EFFECT OF ECONOMICS ON SOVIET INFLUENCE

The Soviet Union, with the second largest economy in the world, has added this economic factor to its previous implements of world influence. Instability has often characterized Soviet influence, which was principally dependent on ideology and arms transfers. Reliance on these two sides of a triad of power and influence, at the expense of a stabilizing economic base, has proven ineffective in the establishment of long-term Soviet-client solidarity. The Soviet Army is still the cement that binds Eastern Europe to the USSR. This bond has been strengthened by the integration of East European economies with that of the Soviet Union, through the Council

on Mutual Economic Assistance. This economic integration, with its resultant dependency, has effected near-total economic reliance of those governments on the Soviet Union. The inclusion of Cuba and Vietnam in the CMEA demonstrates the Soviet's global ability to extend this binding economic influence.

It is the intent of the Soviet Union to form a more operable and lasting extension of power through a stable triangle of influence, with Marxist/Leninist ideology and political structure on one side, military arms supply on the other side, and an ever-expanding, stabilizing economic base [Ref. 4: p. 77]. The purpose of this study is to examine the economic viability of these Soviet intentions, by reviewing the economic and trade development of the Soviet Union (Chapter II), trace the effect of détente on East-West trade (Chapter III), track the Soviet Union's entry into Third World markets (Chapter IV), and evaluate the probable development of Soviet world trade based on capabilities and future needs (Chapter V).

II. HISTORIC SOVIET TRADE DEVELOPMENT

A. WORLD WAR I AND THE BOLSHEVIK REVOLUTION

World War I and the Bolshevik Revolution disrupted for a time and altered the form and type of trade conducted by Europeans, Russians, and Americans. The war did not drastically change the long-established European trading patterns. However the Bolshevik Revolution, a Allied blockade, and revolutionary economic policy in Russia fundamentally stopped trade with the West for almost five years. By 1921, the Soviet economy was almost in total collapse. There had been sharp declines in agricultural and industrial production, widespread disorganization of transportation, and acute shortages of food and fuel. This led to peasant uprisings and riots by factory workers in 1920. A "temporary retreat" from communism was necessary for the purpose of economic reconstruction. On March the 17th, a New Economic Policy (NEP) was announced. With this liberalization, the Soviets accepted a foreign concessions policy. The Soviets accepted, or more appropriately were forced to accept, a policy of foreign concessions because the production facilities had all but ceased to produce. The extent of Russia's economic collapse is superbly exampled by the collapse of the Caucasus oilfields in 1921. Antony C. Sutton, in Western Technology and Soviet Economic Development 1917-1930, asserts that by 1920-21, because of labor shortages and inefficiency, transportation problems,

lack of maintenance supplies and equipment, and a total breakdown of the electrical supply system, the Caucasus oilfields essentially ceased production.*

Only through Soviet concessions to the United States, Japan, the United Kingdom, Norway, Italy, France, and Germany, was it possible to reverse Soviet declining oil production. Western equipment, technology, and manpower was used in all phases of Soviet oil production and transportation, from actual drilling to the supply and welding of pipelines. Soviet crude oil production and oil exports nearly tripled from 1923 to 1928 [Ref. 5: pp. 16-44]. The production and export of oil and oil products was not only critical in the development of much-needed hard currency, but was also essential to the industrialization of the Soviet Union.

The Soviet-Western development of the oil industry is representative of the development of most major industries in the Soviet Union in the 1920's. The Soviet oil industry in the 1920's was critical to the development of other heavy industrial sectors and accounted for the major portion of Soviet exports then, as it continues to do today. Additionally, it provides background to the recent controversy over the Siberian gas pipeline to Western Europe.

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*A detailed and more complete picture of the Caucasus oilfield collapse is contained in Appendix A, extracted from Western Technology and Soviet Economic Development 1917-1930, by Antony C. Sutton. [Ref. 5: pp. 16-17]

Views on the effect of trade with the Bolsheviks were as diverse in the early 1920's as they are today.

> I believe we can save her (Russia) by trade. Commerce has a sobering influence. Trade, in my opinion, will bring an end to the ferocity...and the crudity of Bolshevism surer than any other method.
>
> Lloyd George, 1922

> The capitalist countries...will supply us with the materials and technology we lack and will restore our military industry, which we need for our future victorious attacks on our suppliers. In other words, they will work hard in order to prepare their own suicide.
>
> V. I. Lenin, 1921

Many scholars today add to Lenin's view that the capitalist countries will also supply the credit necessary to purchase the needed materials and technologies for their ultimate demise.

B. STALIN AND THE FIRST FIVE-YEAR PLAN

With the death of Lenin and the victory of Stalin over Trotsky, a New Socialist's Offense, the first Five-Year Plan, was initiated to rapidly industrialize the Soviet Union. Stalin, in 1928, declared: "We are 50 or 100 years behind the advanced countries. We must make good this distance in 10 years. Either we do it, or we shall be crushed." [Ref. 6: p. 21] Stalin recognized the immediate need to continue trade with the West to achieve rapid industrial growth. At the same time, he demanded Soviet self-reliance. To accommodate these demands, the granting of concessions was halted in favor of the direct purchase of Western industrial goods and processes. This policy rapidly exhausted the Soviet hard currency and credits. By 1931, the Soviet Union's

trade deficit was 230 million rubles. To alleviate the deficit, the Soviet Government curtailed foreign imports and broke many existing contracts with Western firms. [Ref. 7: p. 2]

Through the 1930's, the Soviets' principle trading partner continued to be Germany, based on the 1922 Treaty of Rapallo. The German-Soviet agreement established strong economic and political ties between the two outcast powers. The Rapallo Treaty was supported by a commercial treaty on 12 October 1925, and the Treaty of Berlin in 1926 [Ref. 8: p. 1034]. A Nazi-Soviet trade agreement in August 1939 continued the legacy of German-Soviet trade. In expressing the Soviet view of the agreement, Molotov said, "this agreement is advantageous to us because of its credit conditions and because it enables us to order a considerable additional quantity of such equipment as we need." [Ref. 9: p. 2] On 22 June 1941, Soviet-German trade stopped.

C. WORLD WAR II AND THE COLD WAR

World War II and the ensuing cold war transformed the traditional European trading patterns. Tensions between the Soviet Union and the other Allied powers began to surface before the end of the war. Thus, with the defeat of Germany, the United States and Great Britian almost immediately cut off the supply of lend-lease material to the Soviet Union. Figure 1 [Ref. 10: p. 63] depicts the drastic reduction of U.S. exports to the USSR from $149,069,000 in 1947, to a

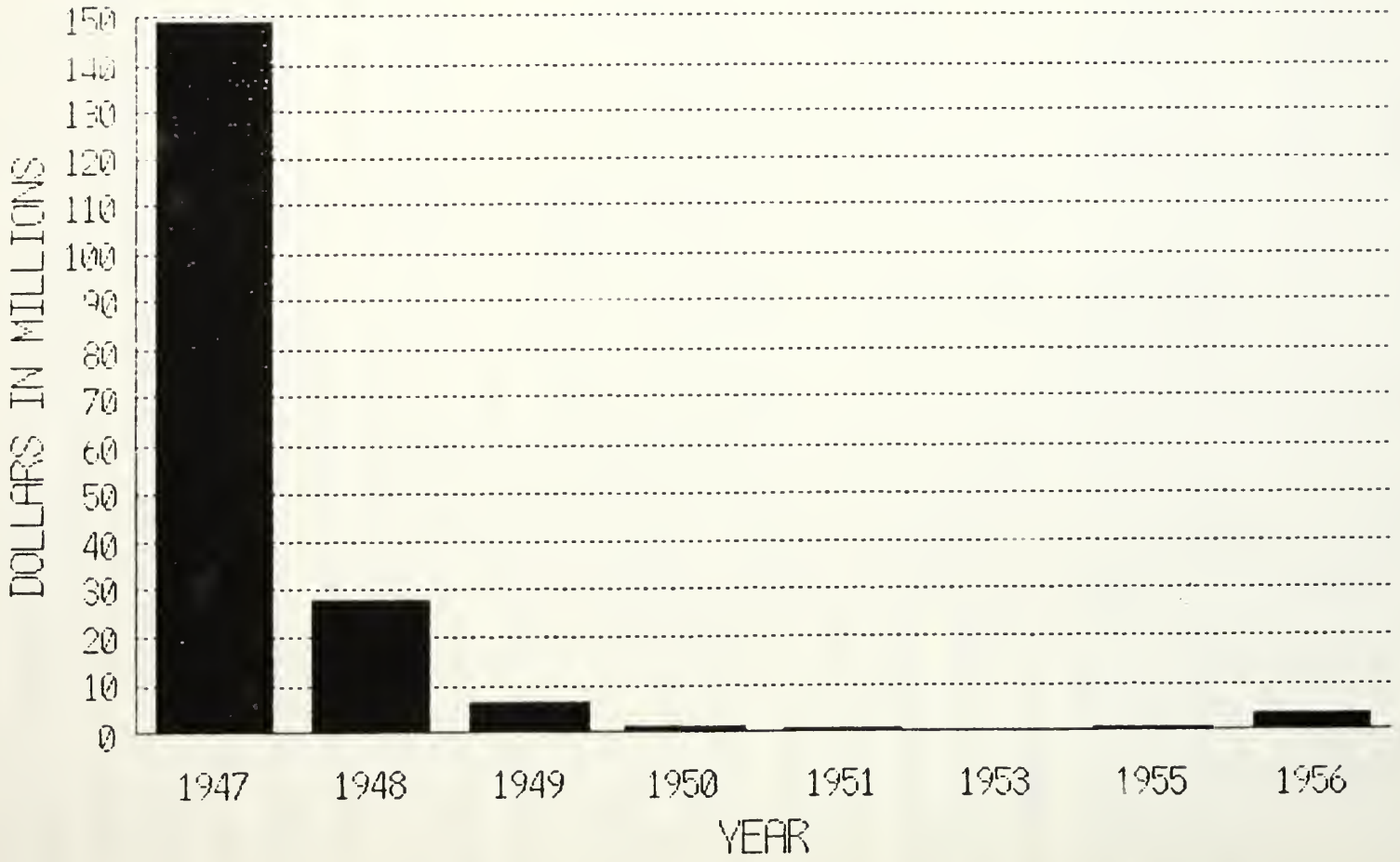

Figure 1. U.S. Exports to USSR 1947-56. Source: Benjamin H. Williams, United States Economic Foreign Policy, Vol. XVI, p. 63.

low of $19,999 in 1953. The economic isolation of the Soviet Union, and consequently Eastern Europe from Western Europe, was firmly established by the Soviets' expected refusal to cooperate in the Marshall Plan. The Coordinating Committee (COCOM) was also established to standardize member countries' prohibited items of export to the Communist bloc. The COCOM was additionally charged with establishing a recommended policy on export control.

In the early 1950's, Stalin established the theory of two world markets, the socialist world market and the capitalist world market, which included the Third World. Interaction between these separate markets would not only be undesirable, but unnecessary. Malenkov elaborated on Stalin's thesis at the XIX Congress of the CPSU, stating:

> As Comrade Stalin pointed out, the united comprehensive world market has disintegrated and formed two parallel world markets: the market of countries on the peaceful democratic camp, and the market of the countries of the aggressive camp. The disintegration of the united comprehensive world market is the most important economic result of the Second World War and its economical consequences.
>
> Two world markets are developing in opposite directions. The new, democratic peaceful world market has no difficulties in selling goods because its capacity is increasing year by year, and accordingly there is a crisis-free growth of production in the countries of the democratic camp because the non-stop growth of production is extending more and more the capacity of the democratic market. [Ref. 11: p. 82]

D. KHRUSHCHEV, THE THEORY OF "PEACEFUL TRANSITION"

With Stalin's death in 1954, and the emergence of Khrushchev's leadership in 1956, economic relations between the

two blocks began to change. Unlike Stalin, Khrushchev saw the potential benefits of both international trade and aid. He formulated the theory of "peaceful transition" for the economic evolution of newly independent countries toward socialism. He believed that by giving aid, principally in the form of large industrial complexes intended for state ownership, the Soviet Union could obtain control of the country's foreign trade and guide it into socialism. He formulated that if 40 percent of a developing country's foreign trade was with the Soviet Union, that country could be forced down the Socialist path (Ref. 11: p. 71). A prerequisite of this peaceful transition was the elimination of class interest. The newly independent countries of Africa were appealing targets for Khrushchev's new policy. They were seen as truly classless societies with small national economies, thereby making it less difficult to capture a large proportion of their foreign trade.

To further his Third World expansionist goals, Khrushchev attended the 15th United Nations General Assembly meeting, promising support in the "liquidation of the past colonial system." To African national representatives, he further promised that "we are prepared to provide aid whenever you request it."(Ref. 11: p. 72) Unfortunately for Khrushchev and the Third World, these proved to be hollow promises.

The grandiose promises and plans of Khrushchev for capturing the Third World through the process of peaceful

transition was beyond the economic power of the Soviet Union. Soviet economic aid to the Third World from 1955 to 1964 totaled only $2,566 million. The aid was essentially machinery, equipment, and turnkey projects which were plagued by the poor quality of goods and construction delays. Table I (Ref 11: p. 72) illustrates the Third World regional distribution of Soviet economic and military aid during this period.

TABLE I

Soviet Economic and Military Aid to the Third World, 1955-1964

(million U.S. $)

	Military aid	Economic aid
Total agreements	4,291	2,566
Middle East	1,437	1,217
South Asia	1,655	180
Africa	735	33
East Asia	404	1,136
Latin America	30	-

Source: Gu Guan-fu, "Soviet Aid to the Third World, An Analysis of Its Strategy," Soviet Studies, Vol. XXXV, no. 1 p. 72.

While military aid at this time was almost twice as large as economic aid ($4,291 vs. $2,566 million), it was in much closer balance then than now. Recently, Soviet military aid has been about six times the amount of its economic aid. [Ref. 12: p. 9]

E. KHRUSHCHEV AND EAST-WEST TRADE

In addition to a fundamental shift in the Soviet approach toward the Third World, 1956 marks in time a drastic change in the Soviet perception of East-West trade. In that year, Khrushchev visited Britain with his famed 1,000 million pound sterling shopping list; the list included over 300 machine tools, and over 1,000 types of foundry equipment [Ref. 13: p. 153]. John W. De Pauw reports in Soviet-American Trade Negotiations that the first positive step toward an expansion of U.S.-Soviet trade was taken in 1956 when President Eisenhower authorized the decontrol of some 700 items in 57 commodity categories for the export to the USSR and Eastern Europe. Figure 1 reflects Khrushchev's trade initiative showing an increase in U.S. exports to the Soviet Union from $19,000 in 1953 to $3,819,000 in 1956. Additional initiatives were taken in 1959 when Soviet Communist Party First Secretary Khrushchev and President Eisenhower, during the course of the Camp David talks, explored the subject of trade between their respective countries. Specific mention was made at these talks of those commodities with commercial potential as well as those falling within the category of strategic items. The net effect of this meeting was an increase in the export of U.S. manufactured goods, including consumer durables, to the Soviet Union. [Ref. 14: p. 1]

During the same timeframe, Western Europe was also starting to reestablish historic trade ties with Eastern Europe. Trade between Western and Central Europe had been a normal

and desirable activity. Traditional Russo-German trade examples the long historic development of East-West trade. Angela Stent Yergin in East-West Technology Transfer: European Perspectives reports that for over a century, Germany had exported advanced machinery to Russia in return for imports of raw materials. The same paper provides the following statistics which reveal the historic common orientation of the two economies:

> From 1858 to 1862, imports from Germany were 28 percent of Russia's imports, and exports to Germany were 16 percent of Russia's exports. From 1868 to 1872, the figures were 44 percent and 24 percent respectively. In 1914--the best year--the figures were 47 percent and 29 percent. After the Bolshevik revolution, the Soviet government continued to seek German machinery imports, and there was considerable German-Soviet clandestine military cooperation. Although the volume of trade between the two countries declined after the Nazis came to power, German-Soviet economic cooperation continued until the Nazi invasion of the USSR. [Ref. 15: p. 17]

These traditional trading patterns were altered by WWII and the political considerations of Western Europe at the conclusion of the war. At that time, Western Europe was reliant on the economic power of the United States exercised through the Marshall Plan.

On 25 March 1957, the Rome Treaties were concluded (Ref. 8: p. 1182). These treaties created the European Economic Community (EEC). The Federal Republic of Germany insisted on a special protocol to reaffirm the economic unity of Germany, which had been an initial stated goal of the Allies at the end of WWII. As a result, it was established that inter-German trade would not be affected by the European Economic Community's regulations [Ref. 16: p. 31]. In

respects this protocol had an enormous impact on East-West trade; it had provided an opening or a gap for trade between the EEC and the Council for Mutual Economic Assistance (CMEA or COMECON).

COMECON had been established in 1949 by Stalin as an alternative to the Marshall Plan. Its policies, not surprisingly, like Stalin's were inward-looking, designed to promote Soviet power and integrate the region economies. COMECON members now include the Soviet Union, German Democratic Republic, Romania, Poland, Hungary, Bulgaria, Czechoslovakia, Mongolia, Cuba, and Vietnam. Yugoslavia has associate membership, and Finland, Iraq, and Mexico have cooperation agreements with COMECOM. In addition, Afghanistan, Angola, Ethiopia, Laos, Mozambique, and Yemen (Aden) have been granted observer status in the CMEA. Mirror imaging the intent of COMECOM, the Soviet Union viewed the EEC as a political and economic arm of NATO. In a thesis on the Common Market by the Moscow Institute of World Economy and International Affairs in 1957, it was asserted that "no doubt the European Economic Community will accelerate the process of self-destruction." [Ref. 17: p. 3]. The Soviets wanted to keep East European countries from trading with the EEC, to avoid capitalist contamination and reduce the viability of the EEC. But Poland, in 1965, and Bulgaria, Hungary, and Romania in 1969, had reached technical agreements with the European Economic Community on the imposition of farm levies on their sales to EEC countries. (Ref. 17: p. 3)

F. THE DECLINING SOVIET THREAT

Between 1956 and 1969, with some serious deviations from the norm, the perceived Soviet military threat to the West gradually declined. This decline was coupled with a rebound of the export-oriented European economies. Without a firm consensus on the intentions of the Soviet Union, Western Europe looked to traditional markets in Eastern Europe to sustain their economic development. The theory that the Soviet Union was evolving and maturing took shape. Essentially, the argument was that:

> The Soviets, to solve their economic internal problems, would need and would seek Western help. Such assistance should be offered so that Moscow would then become entangled with Western exports, credits, imports, etc. (Ref. 2: p. 8)

The theory was based on establishing interdependence between the world systems, thereby making war within the system too costly to consider seriously.

President Kennedy is credited by some for initiating the era of détente. In his address to the American University in 1963, he stressed the world's common interests and the hope for constructive change within the Communist bloc:

> So let us not be blind to our differences, but let us also direct attention to our common interests and to the means by which those differences can be resolved. And if we cannot end our differences, at least we can help make the world safe for diversity. For in the final analysis, our most basic common link is that we all inhabit this planet. We all breathe the same air. We all cherish our children's future. And we are all mortal.
>
> Third: Let us reexamine our attitude toward the cold war, remembering that we are not engaged in a debate, seeking to pile up debating points....

> We must, therefore, preserve in the search for peace in the hope that constructive changes within the Communist bloc might bring within reach solutions which now seem beyond us. We must conduct our affairs in such a way that it becomes in the Communists' interest to agree on a genuine peace. (Ref. 2: p. 9)

President Johnson attempted to carry the Kennedy theme further through "building bridges" to Eastern Europe, "bridges of increased trade, of ideas, of visitors, and of humanitarian aid." He placed emphasis on the development of trade and understanding between the United States and the Soviet Union, and recommended a two track NATO policy of "détente and defense." (Ref. 2: p. 20)

Each successive United States President from Eisenhower to Nixon brought the nation closer to détente with the Soviet Union. The enduring keystone of détente was the opening of East-West, and trade.

III. DÉTENTE-INCREASED EAST-WEST TRADE

A. THE SOVIET VIEW OF TRADE IN THE 1970'S

During the 1960's the Soviet Union, still leery of the consequences of foreign trade, gradually increased trade with the West and the Third World. By 1970, the Soviet fear of capitalist contamination had been replaced by a driving desire to increase their economic well-being, influence, and world presence through trade and aid. This shift in foreign trade policy resulted from the Soviet Union's recognition of the economic and political benefits derived from trade. V. I. Lenin, of course, supported this new view of Soviet foreign trade. The USSR Report on the Foreign Economic Relations of CMEA Countries Under the Conditions of Socialist Integration points out that, "the concept of the foreign or world market is inseparable from the concept of the international division of labor, which constitutes the basis of the entire system of world economic relations. The degree of development and the scale of the world market is inseparably connected with the degree of specialization of national labor." (Ref. 4: p. 77)

The same report bluntly points out the Soviet-perceived connection between foreign trade and other forms of cooperation, stating that "one must not underestimate the importance of foreign trade and other forms of cooperation, since the other forms of cooperation are directly or indirectly connected with foreign trade." (Ref. 4: p. 77) More

important than the political opportunities for the Soviet Union, presented by increased world trade, was the immediate need for Western and Third World products. From the West, the Soviets needed advanced technology to improve and modernize their industrial base. They also needed grain from both the West and the Third World to make up for the lack of growth in domestic production, and to meet the minimum goals set by the 10th Five-Year Plan.

B. SHIFTING PATTERNS OF TRADE

Political and economic needs served to reduce gradually the strong opposition which the Soviet Union had voiced toward dealings with the West. Leonid Brezhnev's comments on dealing with the EEC illustrate this changed Soviet attitude. On 20 March 1972, Brezhnev stated that:

> The Soviet Union by no means ignores the real situation which has emerged in Western Europe, including the existence of an economic grouping of capitalist countries known as the Common Market. We are carefully observing the activity of the Common Market and its evolution. Our relations with the participants in the grouping will, needless to say, depend on the extent to which they recognize the realities in the socialist part of Europe, particularly the interests of the member countries of the Council for Mutual Economic Assistance (COMECON). We are for equality in economic relations and against discrimination. [Ref. 17: p. 3]

The Soviet Union wanted the European Community to recognize and deal through COMECON for the Soviet's recognition of the EEC. There was little apparent gain for the European Community from such mutual recognition. In the early 1970's, it was felt that the East Europeans needed trade with the West

more than the West needed trade with the East. This is demonstrated in the East-West trade deficits. Between 1958 and 1970, COMECON's exports to the European Community rose 300 percent, while the Community's exports to COMECON rose 385 percent. For the year 1974, the CMEA (COMECON) imported $12 billion worth of investment and consumption goods, while the European Community purchases approximately $9 billion worth of raw materials, energy products, and an increasing number of partially-manufactured goods. [Ref. 18: p. 26]

These trade increases show that the early 1970's ushered in détente, and détente meant increased East-West trade. In November of 1971, the Secretary of Commerce led a U.S. delegation to the Soviet Union for the first official talks on expansion of trade and other commercial relations. (See Ref. 14, p. 3.) This, as Jurgen Notzold asserts, came in the wake of the Strategic Arms Limitations Talks (SALT) negotiations, the Four-Power Agreement on Berlin, the so-called "Eastern" treaties of the Federal Republic, and the fundamental treaty between the Federal Republic and the German Democratic Republic, establishing a new legal basis for political relations with both the U.S. and the Federal Republic of Germany. The attempts at an understanding between the superpowers and the Eastern policy of the Federal Republic of Germany led to the elimination of a significant part of the uncertainty concerning political and security questions which had for long overlaid East-West economic relations. [Ref. 19: p. 182]

The reopening of East-West trade brought a distinct regional redistribution of Soviet capital goods imports away from the CMEA to the OECD countries. The CMEA share of trade with the Soviet Union declined from 71.5 percent in 1973, to 54.9 percent in 1976, while that of the OECD countries rose during the same period from 25.9 percent to 40.3 percent. This shift is presented in Table II.

TABLE II

Redistribution of Capital Goods

(Shares of OECD and CMEA countries in USSR imports of machinery and transport equipment, in percent.)

	1955	1960	1970	1973	1974	1975	1976	1977	1978	1979
OECD	16.5	25.5	25.9	25.9	30.3	38.5	40.3	38.0	31.7	30.2
Of which:										
W.Germany	1.8	5.8	3.3	7.3	9.2	11.3	10.7	9.2	7.0	7.0
USA	0.0	1.7	0.6	3.2	3.1	5.0	6.0	3.6	1.9	2.4
Japan	0.0	1.1	2.9	3.0	3.1	4.9	4.8	6.0	5.7	4.5
France	1.1	3.7	4.2	2.6	4.4	4.7	4.9	4.9	4.7	4.8
Italy	0.5	1.8	4.8	2.8	2.6	3.5	3.1	4.2	3.3	2.8
UK	2.9	3.4	2.6	1.7	0.9	1.7	1.7	0.9	1.6	1.8
Finland	7.3	4.8	3.5	2.6	2.9	3.5	5.0	5.8	5.1	4.3
CMEA	79.2	72.1	70.8	71.5	65.7	57.2	54.9	57.3	63.0	64.8
Of which:										
GDR	42.5	34.5	24.6	24.5	21.9	18.4	17.0	17.4	17.8	18.8
Czech	16.9	17.5	1600	13.3	12.5	10.9	-	11.2	12.9	12.4
Poland	8.0	7.2	11.1	11.4	10.6	9.9	8.8	9.3	10.4	11.8

OECD countries: USA, Japan, W. Germany, France, Italy Great Britain, Sweden, Finland, Austria, Switzerland

CMEA countries: German Democratic Republic, Poland, Czechslovakia, Hungary, Romania, Bulgaria

Source: Wolfgang Berner, et. al., The Soviet Union 1980-81, p. 182.

C. DIVERGENT U.S. TRADE POLICY

Through the mid-1970's, and into the 1980's, trade between the West and East grew at an ever-accelerating pace. According to John Starrels, in 1982, combined U.S.-E.C. trade with the Soviet Union and COMECON's partners came to $48 billion [Ref. 20: p. 25]. U.S. and West European subsidies contributed to the acceleration of this trade [Ref. 21: p. 1]. The deteriorization of the Soviet-U.S. relations in the wake of the Soviet invasion of Afghanistan, the Polish crisis, and Washington's reassessment of the policies of detente, have served to reduce U.S. trade with COMECON's European members to $3.6 billion in 1982. This is a decline from $8 billion in 1979, and represents a $1 billion decline between 1981 and 1982. Western European trade policies with the East have not been in harmony with the policies of the United States. During the time that the United States was diminishing trade with the East, the West Europeans have continued to foster closer economic and trade relations with COMECON members. The scale of East-West trade in 1982 is shown in Table III.

This divergent economic policy has created considerable strain between the United States and the European Community. In concert with the interdependent policies of détente, the European Economic Community has continued to seek trade with Eastern Europe as a means to induce moderate behavior on the part of the USSR, and foment reform at the very heart of the Soviet system [Ref. 22: p. 600]. From Washington's global vice Europe's regional perspective of Soviet international

TABLE III

East-West Trade, 1982

E.C. exports to Eastern Europe	$ 16.9 billion
E.C. imports from Eastern Europe	$ 2.4 billion
E.C. exports to USSR	$ 8.8 billion
E.C. imports from USSR	$ 16.7 billion
U.S. exports to Eastern Europe	$ 1.01 billion
U.S. imports from Eastern Europe	$839.4 billion
U.S. exports to USSR	$ [illegible] billion
U.S. imports from USSR	$22[illegible] million

Source: See Ref. 20, p. 26.

behavior in recent years, it is difficult to assert that Soviet behavior has been moderate. But it can be said with certainty that East-West trade has--at least in the short run--benefited Western Europe and the Eastern bloc.

For the technologically superior, export-oriented economies of Western Europe, the Eastern bloc appeared to be perfect trading partners. To bolster sagging growth and productivity, the Soviets needed Western technology; to compensate for stagnant agricultural production, and to meet planned increases in meat production, they needed grain. The West, anxious to cultivate and expand foreign markets to insure continued post-WWII growth, wanted traditional imports of energy and raw materials from the Soviets. Ignoring political considerations, this trade appears as a match made in heaven.

D. SOVIET AGRICULTURAL TRADE

The performance of the Soviet agricultural sector had, until the early 1970's, generally kept pace with rising demand. From 1950 to 1970, Soviet agricultural output grew at an annual rate of about 3.9 percent, which compares favorably to U.S. agricultural production which grew at an annual rate of about two percent during the same time period. This relatively steady increase in Soviet agricultural production, and trend estimates of further grain production, is depicted in Table IV.

Soviet agricultural policy rests on a system of subsidies to insure stable food prices for consumers at 40 to 50 percent of the cost of production. Food costs for Soviet consumers has remained essentially constant since the mid-1950's, while wages have increased steadily, creating higher demand [Ref. 23: p. 16-17]. The combination of price subsidies, fostering the wasteful use of resources, lower labor productivity, central planning inefficiency, poor weather, and increased consumer demand have resulted in reduced agricultural growth and the steady increases of grain and feed imports. Figure 2 reflects the Soviet Union's net grain trade from 1955 to 1981.

From 1972 until 1979, the United States, Canada, and Australia had relative equal shares in the export of grain to the USSR. As the fourth major supplier of grain to the Soviets during this period, Argentina consistently supplied a larger amount of grain to the Soviet Union than the other major suppliers. 1980 marked the beginning of President Carter's grain embargo in response to Soviet moves in Afghanistan.

TABLE IV

Soviet Grain Production, Selected Years, 1953-1981

Year	Grain Production (million metric tons)
1953	82.5
1956	125.0
1958	134.7
1960	125.5
1962	140.2
1963	107.5
1964	152.1
1966-70 average	167.6
1971	181.2
1973	222.5
1975	140.1
1976	223.7
1977	195.7
1978	237.2
1979	179.0
1980	189.0
1981	165.0

USSR: TREND AND ESTIMATED GRAIN PRODUCTION

Year	Trend
1985	218
1986	221
1987	224
1988	227
1989	231
1990	234

Source: U.S. Cong., Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," 31 Dec 1982, pp. 69, 142.

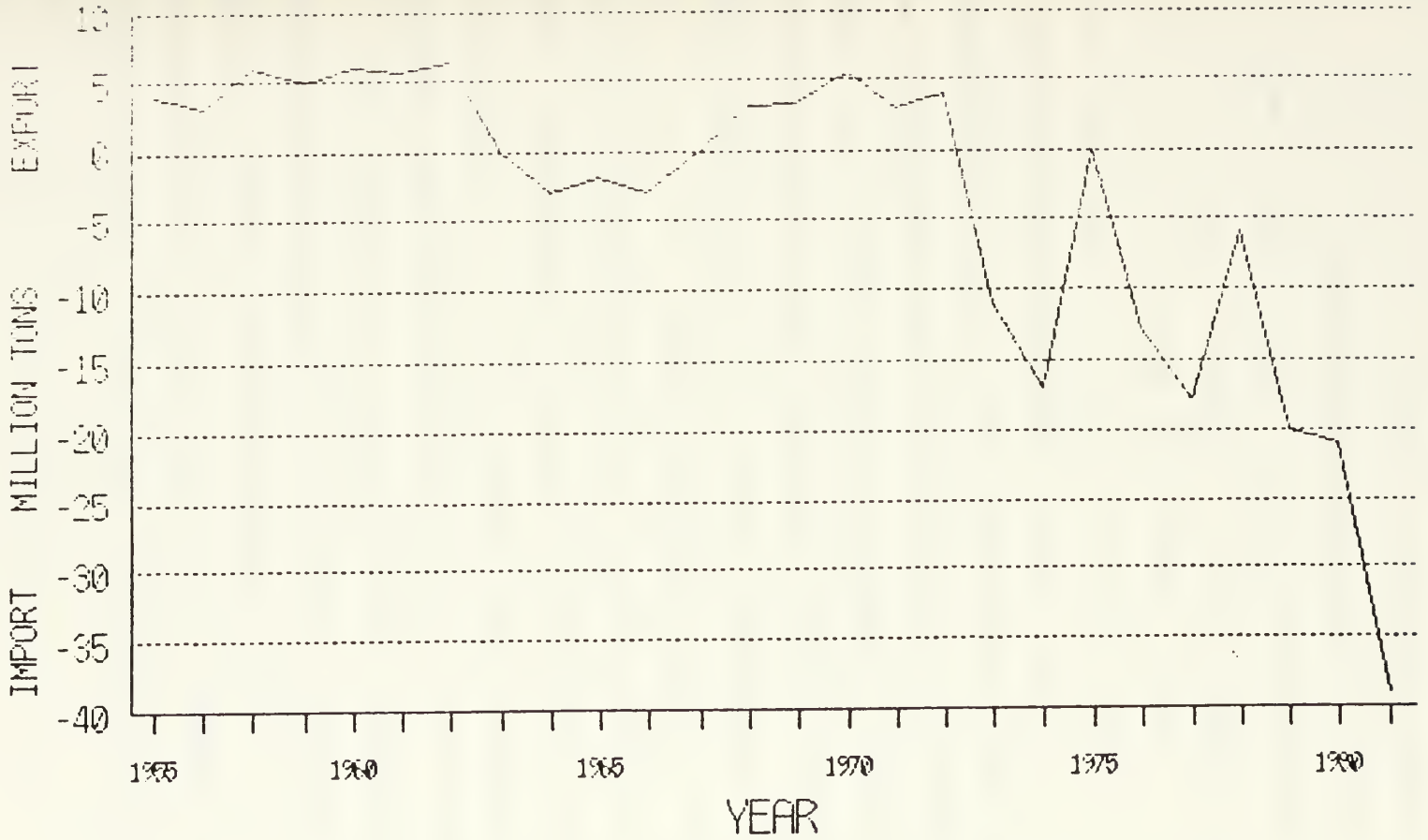

Figure 2. USSR Grain Trade 1955-1981. Source: US, Cong., Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," 31 Dec 1982, p. 83.

In the initial search for cooperation between the other major suppliers of grain to the Soviets, Australia and Canada agreed to limit their sales to "normal and traditional" quantities. Argentina, where grain sales accounted for 30 percent of all exports, had much more to lose in the embargo of grain to the Soviets. The timing of President Carter's announcement of the embargo also played a role in Argentina's decision not to participate. Carter's decision to impose the grain embargo came late on Friday, the 4th of January. Washington officials were unable to contact Buenos Aires officials to solicit cooperation prior to the President's telecast announcing the embargo. Displeasure at the lack of prior consultation, coupled with the friction created by Washington-voiced human rights issues, and the relative importance of grain exports to the economy, were compelling reasons in the Argentinian Government's decision not to support the grain embargo.

As U.S. exports of grain to the Soviet Union were being reduced, but not eliminated, Argentina's exports were filling the void. Recognizing the realities of the ill-conceived embargo, Canada and Australia followed Argentina's lead and soon increased their sales of grain to the Soviet Union. Subsequent long-term governmental agreements have reduced the share of U.S. grain exports to the Soviet Union, and made the selective embargo of grain more costly for the United States by requiring generous compensation to farms for lost sales.

Old lessons on the effectiveness of embargos were re-learned as the cooperation of other grain suppliers to the Soviet Union unraveled. It can be effectively argued that, in the long run, the United States, through reduced grain sales was hurt more by the grain embargo of 1980 than the Soviet Union. Short of war, it is unlikely that grain will ever again be used as a "weapon of peace" against the Soviet Union. [Ref. 23: pp. 124-139]

E. THE DISMANTLING OF DÉTENTE

The dismantling of détente, including a shift in trade policy, started with the Jackson-Stevenson amendments to the trade act. U.S. trade credit was linked to Soviet Jewish emigration policy. This effectively denied further United States credit to the Soviet Union. William G. Hyland notes that "for the first time, a sociological-political change within the USSR became an official object of U.S. foreign policy, a complete turnover of the containment/evolution theory." [Ref. 2: p. 320] United States trade policy toward the Soviet Union continued to evolve during the Carter administration, particularly after the Afghanistan invasion, and took on new dimensions with the election of President Reagan. William P. Clark, as the President's National Security Advisor, stated that in our new policy, "we must force our principal adversary, the Soviet Union, to bear the brunt of its economic shortcomings." [Ref. 24: p. 272] Important aspects of the President's policy have apparently been an attempt

to further tax what is seen as the over-extended, fragile economic system, by denying the Soviets the means of obtaining additional hard currency, further stressing the Soviet system by engagement in an arms race which the President feels they "cannot win," and by increasing efforts to deny the Soviet new technological capabilities from the West, which is viewed as a key element for the continued economic development.

The controversial effectiveness of the United States' policy came to a head in Western Europe with the Reagan administration's embargo of 22 June 1982 on equipment sales by European licensees and subsidiaries of U.S. companies for the 3,600-mile Soviet gas pipeline to Western Europe. [Ref. 25: p. 2] On 12 August 1982, the European Community delivered a note and a lengthy set of legal comments to the U.S. State and Commerce Departments on the export administration regulations issued by the United States on 22 June affecting the Soviet pipeline. The text of the protest from the European Community is provided in Appendix B. (See Ref. 25, p. 6) It clearly questions the legal, political, and economic position of the United States in its move to stop the shipment of high technology equipment to the Soviet Union. The European Community note also presents many of the differing views on East-West trade and technology transfer.

It is obvious from the European Community's reaction to the Reagan administration's embargo that they do not share Washington's views on the East-West trade and technology transfer.

The West Europeans feel that the Reagan administration simply does not understand, and is insensitive to, their situation. Western Europe is just now fully recovered from the effects of the 1973 OPEC oil price increases. The Soviets have proven to be a reliable supplier of energy products; the importation of oil and natural gas from the Soviet Union is not something new.

In 1981 the West German government imported 17 percent of its natural gas from the Soviet Union. Norman Crossland reports that "the Germans are comforting themselves with the thought that the Russians--in their business arrangements with West Germany--have always kept to the spirit and letter of agreements. Some commentators have been reminding us, not very tactfully, that even as the Germans launched their attack on the Soviet Union in 1941, the Russians were conscientiously fulfilling their agreement to supply Nazi Germany with grain. East-West trade and the pipeline construction also meant jobs to the West Europeans; 25,000 in West Germany on the pipeline alone, and 150,000 based on the export trade to Eastern Europe. [Ref. 26: p. 6]

To develop further the background of the current Soviet oil production, it is extremely interesting to note in Table V the recent suppliers of oil and gas equipment for the Soviet industry. Against this background, and the lifting by the U.S. of the grain embargo imposed by President Carter in 1979, it is little wonder that West Europeans viewed President Reagan's sanctions with such disdain.

TABLE V

Imports of Equipment for the USSR Oil and Gas Industry
(million t.r.)

Supplier	1970	1975	1976	1977	1978	1979
Total	21	133	199	126	251	136
of which:						
Romania	13	25	31	39	52	70
USA	--	36	30	21	38	22
W. Germany	--	35	53	15	10	1
France	2	17	16	12	1	15
Great Britain	5	1	16	12	101	14

Source: Wolfgang Berner, et. al., The Soviet Union 1980-81. p. 171.

The European note also punctuates differing opinions on the Soviet's internal technological capability and the effects of technology obtained from the West. This difference of opinion is not restricted to the Reagan administration and the European Community; literature on Soviet technological capabilities covers the entire spectrum of possibilities, from the Soviet view that:

> The Party has restored a Leninist and profoundly scientific approach to the "solution of economic problems." Just as Lenin put forward the task of establishing the material and technical foundation for socialism through industrialization of the country, so the Party has worked out, at this new stage, a plan for the creation of the material and technical basis of communism. One of the distinctive features of the past decade has been the fact that the Party initiated and led the scientific and cultural revolution and thus placed the Soviet Union in the forefront of world scientific and technical progress, making socialism its standard bearer. [Ref. 27: p. 125]

From this assessment of Soviet technological lead, which is supported by some Western authors, the gamut runs to Anthony C. Sutton's assessment that:

> No fundamental industrial innovation of Soviet origin has been identified in the Soviet Union between 1917-65....Soviet innovation has consisted, in substance, in adapting those made outside the USSR or by using those made by Western firms specifically for the Soviet Union and for Soviet industrial conditions and factor patterns. [Ref. 28: p. 15]

The actual technological capabilities of the Soviet Union must lie somewhere between these opposing views.

F. SOVIET TECHNOLOGICAL CAPABILITIES

1. The Soviet Need for Technology

An understanding of the position and strength of the Soviet Union's technological capabilities, and how those capabilities affect Soviet policy, is of vital importance to the development of Western policies on East-West trade and technology transfer. This is particularly important in view of the divergent paths which the United States and Western Europe have taken concerning these issues, which have been accentuated by the U.S. embargo on equipment sales for the Soviet gas pipeline. Underlying the current controversy is the assumption that the Soviet Union is in a very vulnerable economic position, reliant on the introduction of Western technology for continued economic growth. The assertion has been made that:

> The entire Eleventh Plan (1981-1985), in fact, rests on measures to promote what the Soviets call "intensification," that is, more efficient use of existing resources rather than mobilization of

> additional ones. The other key policy on which success hinges is a large increase in labor productivity, to be achieved through better management and more efficient technological innovation; over five years the Soviet leaders hope to gain 23 percent in industry and agriculture, and 15 percent in construction. [Ref. 29: p. 223]

If it is not within the Soviet's capability to provide the technology necessary to achieve these needs, they will by necessity seek these technologies in the West.

The proclaimed scientific nature of Marxist-Leninist doctrine, and the government's continued emphasis on science and technology, for not only the Soviet Union's economy, but also for political purposes is demonstrated in Brezhnev's 1968 speech proclaiming:

> It can be said without exaggeration that in this particular field, the field of scientific-technological progress, now lies one of the main fronts of the historical competition of the two systems. For our party the further intensive development of science and technology and the wise introduction of the latest scientific-technological achievements, is not only the central economic task, but also an important political task. (See Ref. 3, p. 35)

This statement emphasizes the need and acceptance of technological innovation and change. Yet today, by many estimates, the Soviet's technological capabilities are extremely uneven. In some areas surpassing the most advanced Western country, and in other areas 10 to 20 years behind, this difference in itself creates serious difficulties for Soviet planners.

The 11th Five-Year Plan, adopted by the 26th Congress of the Communist Party of the Soviet Union, demonstrates their reliance on the introduction of new technology. The basic goals cited in the current Five-Year Plan include:

--Elaborating a system of measures for the continuous rise in the standard of living of the population.

--Ensuring rapid economic growth and improvements in the structure of the economy.

--Raising efficiency, improving quality, and "all-around intensification of production."

--Acceleration of scientific and technical progress.

--Reinforcing the protection of the environment.

--Perfecting the planning system.

--More efficient shaping of foreign economic relations.

(See Ref. 19, p. 146.)

The 1981 to 1985 economic plan for Soviet growth is based on more "intensive" utilization of resources through the introduction of new technologies. This introduction of new technology has been supported by consistent increases in research and development funding since the early 1950's. The Soviet 1981 Plan Fulfillment Report cited the following:

--Models of new types of machinery, equipment, apparatus, instruments, and automation devices created	About 4,000
--Mechanized production and automation lines installed at industrial enterprises	About 11,000
--Sections, shops, and production facilities converted to comprehensive mechanization and automation	More than 5,000
--Automated record-keeping, planning, and management systems created	500
Including automated management systems for technological processes	300
--Inventions and rationalizers' proposals introduced	4 million

The Plan Fulfillment Report also noted that labor productivity grew by 2.7 percent; more than four-fifths of the increase in production was obtained through higher labor productivity. [Ref. 30: p. 22] The 1981 Plan Fulfillment Report and the 11th Five-Year Plan demonstrate the Soviet's interest in, and need for, technological innovation. At the same time, the Plan Fulfillment Report demonstrates one of the major restraints placed upon innovation and change in the Soviet economic system--central planning.

Through history and communism, Russia is tied to a centralized planned and controlled economic system. This centralized control has created an enormous bureaucratic mechanism which is not only sluggish and wasteful, but also requires compromise and concession throughout the system. G. Marchuk, Vice Chairman of the USSR State Committee for Science and Technology, in discussing the importance of research programs in the 11th Five-Year Plan, illustrates the problem-solving nature of Soviet research, and the complexity of the bureaucracy.

> ...The 170 programs of scientific and technical progress are an important component of the new Five-Year Plan. They have been drawn up by the USSR State Planning Committee, the USSR State Committee for Science and Technology, and the USSR Academy of Sciences, in conjunction with ministries and departments--and, where construction is concerned, with the USSR State Construction Committee. Among them, 41 comprehensive special-purpose programs provide for the implementation of the most significant scientific and technical achievements during the 11th Five-Year Plan. [Ref. 31: p. 22]

Historic Russian peasant culture and the Communist ideology of the Soviet Union internally strives for the maintainence of the status quo. This struggle for stability has

fostered stagnation. All research institutions exist within and for the state; the product of that research must serve in support of the state's ideological doctrine. Soviet ideology remains beyond criticism, for it remains the basis for the existence of the regime. Any economic research contradictory to established ideology may be altered or suppressed. Morton Schwartz, in explaining the Soviet Union's lag in technological development, notes that:

> The continued adherence to Party orthodoxy also helps explain the relative technological backwardness of the Soviet economy and its slowness to change. Wedded to a set of beliefs purported to explain all of human history, the Kremlin rulers tend to regard all of their economic institutions and procedures, such as central planning, collective agriculture, and direct political management, as necessarily sanctified by the scientific laws of Marxism-Leninism. These practices, many of which were actually adopted for reasons of expediency, thus tend to become hallowed principles of a socialist economy. They are also sustained by vested bureaucratic interests. Little wonder that they are so resistant to change. (See Ref. 6, p. 143.)

2. Methods of Technology Transfer

The Soviets have, in many areas, relied on the transfer of Western technology. As a selective technology follower, the Soviets can save research and development resources in areas with lower national priority and apply those resources to other areas of development. The adaptation of borrowed Western technology to the needs of the Soviet Union involves, in most instances, the simplification and standardization of machines and processes. Simplification is necessary to accommodate the less well-trained Soviet worker, and standardization is required for mass production. The copying,

adjustment, simplification, and standardization of technology is not comparable to true innovation. [Ref. 32: p. 207] Reliance on Western technology has also resulted in the slow and uneven development of a technological infrastructure, i.e., laboratories, test facilities, and experimental production facilities.

The transfer of technology from West to East is accomplished through a variety of methods. The United States Office of Technology Assessment lists five categories of technology transfers:

1. Legal transfers made possible by the open nature of Western society, e.g., through perusal of open scientific literature, and NTIS documents, academic exchange, trade fairs, etc.

2. Legal transfers of technologies which are not subject to national security controls on the CCL or COCOM lists, and which are therefore obtained under general license.

3. Legal transfers of technologies under an approved validated license.

4. Illegal transfers through purchase, e.g., purchases by agents, through third countries or foreign embassies, purchases through dummy corporations, etc.

5. Illegal transfers through industrial espionage of the theft of materials classified by the U.S. Government. [Ref. 33: p. 77]

Faced with sluggish economic growth, Soviet leadership is placing increased emphasis on all forms of technology transfer to affect a quick fix on the economy. The Soviet political-economy system has relied in the past on the infusion of labor as a basic method to increase production. Now, with a declining growth rate in the ethnic Russian

skilled labor force, computers and robotics are fundamental to the intensification of the Soviet economy. In both of these fundamental areas, Soviet technology lags behind the West. The U.S. Senate's Permanent Subcommittee on Investigations conducted hearings in 1982 on the transfer of high technology to the USSR from the United States. During the hearings, several specialists testified on the state of the art of Soviet microelectronics, and on the means by which the Soviets achieved their present position. William Casey, Director of the Central Intelligence Agency, reported to the Subcommittee that:

> The KGB has developed a large, independent, specialized organization which does nothing but work on getting access to Western science and technology. They have been recruiting about 100 young scientists and engineers a year for the last 15 years. They roam the world looking for technology to pick up. Back in Moscow, there are 400 to 500 assessing what they might need, and where they might get it--doing their targeting and then assessing what they get. It's a very sophisticated and far-flung operation. [Ref. 34: p. 351]

The extremes these Soviet activities can reach is exampled in Appendix C, which examines two cases of illegal technology transfer to the Eastern Bloc [Ref. 35: pp. 12-23]. These cases demonstrate not only the extremes of Soviet attempts to obtain Western technology, but also the diversity of their attempts. The wide range of legal and illegal means of obtaining technology from the West make enforcement of controls extremely difficult.

As the above case demonstrates, the United States Government has attempted to control the flow of high

technology into the Soviet Union. This attempted control has not been entirely successful, as illustrated by the following comparison of the Soviet K-580 Series computer, and the U.S.-made Intel 8080 Series computer:

Soviet K-580 Series	U.S. Intel 8080 Series
K580IK80 microprocessor	8080 microprocessor
K580IK51 serial interface	8251A programmable interface
K580IK53 interval timer	8253 interval timer
K580IK55 peripheral interface	8255 peripheral interface
K580IK57 DMA chip	8257 DMA chip
K580IK 59 interrupt processor	8250 interrupt controller

There is not only a similarity in the function of the chips, but also a similarity in the numbering of the chips. (See Ref. 34, p. 354.) It is apparent that the Soviets, in many areas, continue to rely on borrowed Western technology. One of the most productive methods of borrowing Western technology is through imports. Table VI identifies Soviet imports by product group from Western industrial countries. Considering political restrictions to East-West trade, the table may also identify weak areas of Soviet technology.

The structured nature of Soviet industry also serves as a restriction to the development and implementation of innovation and change. Industrial managers cannot plan on the introduction of new equipment or procedures until they appear in the Soviet economic plan. Once a new product or process is developed and introduced, it is turned over to

TABLE VI

Shares of Individual Product Groups in Soviet Imports of Machinery and Transport Equipment from Western Industrial Countries

(in percent)

Year	Metal-working	Motor-vehicle	Food and textile	Chemical	Timber & cellulose	Ships
1960	3.2	-	12.6	28.7	7.6	20.1
1965	4.4	-	6.2	23.4	8.0	35.0
1970	5.6	20.7	3.7	8.4	7.5	8.9
1971	6.3	6.7	3.8	14.7	5.5	7.1
1972	9.0	4.9	5.0	20.4	9.3	4.1
1973	9.9	7.5	4.1	17.3	7.8	5.7
1974	5.1	15.9	6.2	13.6	6.4	5.9
1975	2.8	7.1	5.4	9.2	3.4	8.6
1976	5.7	4.7	5.1	19.2	4.6	7.6
1977	6.1	3.9	2.9	31.4	5.2	8.2
1978	6.7	1.8	2.1	27.2	4.2	8.4
1979	6.7	3.1	2.7	27.3	3.4	7.6

Western Industrial countries: USA, Japan, Great Britain, France, West Germany, Italy, Sweden, Switzerland, Austria, Finland

Source: Wolfgang Berner, et. al., The Soviet Union 1980-81, p. 189.

industrial managers. The industrial manager, faced with stringent production quotas, may not share the same enthusiasm toward the introduction of the process as did its developer. The industrial manager's reluctance to introduce new, unproven methods of production is understandable. If the new process or equipment does not meet the developer's expectations, it

is the industrial manager who will bear the consequences of production shortfalls.

3. Level of Soviet Military Technology

When presented with the obstacles placed in the path of innovation and change by the Soviet socio-economic system, the impressive advances in military technology appear inconsistent. The Department of the Navy Office of Information lists the following areas of Soviet forces with technological superiority:

--anti-ballistic-missile systems

--fractional-orbit ballistic missiles

--strategic air-defense interceptors

--all aspects of civil and industrial strategic defense and recuperative planning

--tactical anti-ship missiles

--surface attack ships (excluding carriers)

--anti-aircraft artillery systems

--some armored combat vehicles

--medium- and high-altitude SAM air defense

--surface-to-surface tactical missiles

--heavy-lift helicopters

The Navy also acknowledges approximate technological parity with the Soviet in:

--tanks and anti-tank weapons

--satellite tracking systems

--satellite navigation systems

--small arms

The Navy Office of Information further reports that: "Relative to the popular image of unquestioned U.S. technological supremacy of the 1940's and 1950's, it is evident that we have not held our own against determined competition." [Ref. 36: p. 3]

The foregoing information does not include the vast areas of technological supremacy still maintained by the United States. It should also be stressed that there are estimates of Soviet superiority. There have been no direct, conclusive comparisons made in many of the listed areas. The assumptions are based on intelligence gathered from a variety of sources, and, while probably accurate, they are only estimates.

In a country that is generally accepted to be 10 to 20 years behind the West in many areas of technological achievement, the parity indicated in military technology demands explanation. Although the Soviet economy is less than two-thirds of the U.S. economy, their investment in defense spending is higher than ours. It is calculated that from 12 to 18 percent of the Soviet's Gross National Product is spent on defense, compared to five to six percent of the U.S. Gross National Product. With these large expenditures, the Soviet defense industry receives the best engineers and scientists available in the system, and defense industry workers receive higher wages than comparable workers in other industries. Because of uneven levels of technological

development and unreliable production, the Soviet military industrial complex attempts to be as self-sufficient as possible.

This attempted self-sufficiency, combined with emphasis on security within the military industrial complex, thwarts the diffusion, or spillover, of technology into other areas of the economy. The cycle created by uneven levels of technological development accelerates the growing gap in the technological development between the military and other sectors of the economy.

The Soviet military industrial complex is nevertheless faced with some of the same restraints to innovation and change as the rest of the economy. The military industrial sector maintains the separation of research and development, design, and production responsibilities. Soviet labor intensive manfacturing processes and production quotas drive designers and producers to the use of proven technology. In J. W. Kehoe and K. S. Brower's study of Soviet weapons system design, they reported that:

> Soviet weapons are designed as far as possible using on-the-shelf components. Soviet designers appear even to accept performance penalties when standardized parts cannot provide the desired performance. Hence, American weapons systems, although in some cases highly standardized, do not have the same degree of standardization as is seen in the Soviet Su-7 and Su-9, and which uses the radar and missile system from the Yak-28 and the engines of the same type as that used in the MIG-21.
>
> The standardization in Soviet weapon systems appears to reduce system development risks and improve producibility and reliability. However,

it also restricts technical innovation and system performance. [Ref. 37: p. 709]

4. Varied Level of Soviet Technology

With these inherent structural barriers to the development, introduction and diffusion of technology, the Soviet Union has in some areas closed the technological gap, and in others surpassed the West. According to Ronald Amann, it is generally accepted that the Soviet Union is equal or has a technological lead in the priority areas of space exploration, aircraft, military equipment, and some sectors of heavy industry such as blast furnaces, rolling mills, and welding equipment. The Soviets are behind the West in chemicals, electronics, light industry, and construction material. (See Ref. 13: p. 27)

The current levels of Soviet technological capabilities dispel the assumption that the Soviets are totally dependent on the West for the introduction of new technology. B. Shcherbina, Soviet Minister for the Construction of the Petroleum and Gas Industry Enterprises, reported that after the sanctions imposed by the United States on pipeline equipment:

> In an unprecedentedly short time, designers and the collectives of machine-building enterprises organized the output of Soviet-made equipment, including gas-pumping units. Today 20 compressor stations out of 40 have been outfitted with 16- or 25-megawatt compressors made in the USSR....It was planned to equip 33 of the 40 stations on the Urengoi-Pomary-Uzhgorod gas pipeline with gas-pumping units purchased from West European firms. [Ref. 38: p. 12]

In this case it is apparent that the Soviets had the capability to produce the equipment necessary for completion of the pipeline. The Soviet decision to buy Western equipment was most probably based on comparative cost rather than on capability.

In the Ekonomicheskaya gazet, N. Antonov argues the merits of Soviet-U.S. cooperation in science and technology, emphasizing the benefits to the United States. Quoting from testimony to the U.S. Congress by F. Press, then advisor to the President for Science and Technology, he concluded that the United States receives more direct advantages from cooperation with the Soviet Union than the Soviets receive from the United States. Exampled by Press' testimony that:

> Experiments in magnethydrodynamics at the (Soviet) Institute of High Temperatures have provided us with valuable information that will help us in designing and building our own MHD installation. We have received from the Soviet Union wastewater-treatment technology which, our experts estimate, would have cost $55 million to develop. Information in the field of thermonuclear fusion obtained as a result of cooperation has saved the United States up to two years in experimental work and about $10 million. there are similar concrete examples in the fields of public health, ocean studies, and space research. [Ref. 30: p. 14]

This provides further evidence that the Soviets are capable of implementing the highest levels of new technology. It again indicates that the development of Soviet technology is more dependent on the State's priorities and allocation of resources based on opportunity costs than on the lack of specific capability.

In recent years, the Soviet Union has only imported between four and six percent of its total domestic investment in plants and equipment. (See Ref. 13: p. 29) This is a lower figure than that of any Western industrial country, and represents, in part, the Soviets' capabilities in the development of new technology. It is argued that it is not how much the Soviets import, but the relative importance of what they import. A case developed by Ronald Amann demonstrates this point. He reports that:

> It is extremely expensive to create a system for the high voltage transmission of electric current. This involves large expenditures on excavation, pylons, cables, power stations, and so forth. However, the technological linch-pins of this system are the circuit breakers, which in the Soviet case were, at one important point in time, imported initially from France: these may represent a relatively small portion of total investment, but without them the system would not work. Thus, dependence on these "key" technologies (possibly priced in terms of their value to other Western countries) is not highlighted in global statistics of machinery imports. (See Ref. 13: p. 30.)

Today the Soviet Union is credited with having the most extensive and modern electric transmission systems in Europe.

It can be concluded that the Soviet Union has a varied but real technological capability. In priority areas such as heavy industry and the military, the Soviet Union's technological capabilities compare favorably to the industrial West, and by importing technology in these and other areas, they have been able to save valuable resources and development time. The United States Office of Technology Assessment asserts that "nowhere has it been demonstrated

that it (the Soviet Union) has obtained any technology from the West which it could not have developed itself, given adequate incentive and resources." (See Ref. 33: p. 76.)

While there are many constraints on the Soviet system, the availability of research and development resources is a major restriction to expanded progress. The importation of Western technology has been, and will continue to be, an effective Soviet approach in the maximization of opportunity costs. The Soviets simply do not have the internal resources necessary to simultaneously develop the technological capabilities of all sectors of the economy. This will drive the Soviets to the West for modern technology in efforts to bolster their sagging economy. As noted in The Soviet Union 1980-81:

> ...one of the central factors impelling the Soviet Union toward closer economic relations with the Western industrial countries, namely its increasing economic development problems, will certainly not diminish in importance in the years to come. Like its predecessors, the 11th Five-Year Plan relies, even more than earlier plans, on technical progress as the crucial factor to raise productivity and ultimately generate economic growth. More than 90 percent of the increment in industrial production is to be achieved by raising productivity. Such an objective will lead to a continuing high demand for modern machinery and equipment, which cannot be met by domestic production and CMEA countries' deliveries alone. (See Ref. 19: p. 189.)

This outlook is supported by the unprecedented and continuous increase in trade between the industrial West and the Soviet Union from early 1970 to the present.

G. SOVIET TRADE WITH THE INDUSTRIAL WEST

While the shift in Soviet trade patterns predated détente, it took on new emphasis with the relaxation of tensions in the early 1970's. In 1965, Soviet trade with the industrial West accounted for only 19 percent of its total world trade. By 1981 this trade had risen to 34 percent of the Soviet's world trade. During the same time period, 1965 to 1981, the share of East European trade with the Soviet Union declined from 58 percent to 40 percent. (See Ref. 23: p. 460.)

The Soviet Union's major trading partners are East Germany, Czechoslovakia, Bulgaria, Poland, Hungary, West Germany, Cuba, Finland, Italy, and France. To further dominate and control the East European members of CEMA, the Soviets have continued the process of integrating the economies of the Socialist countries. At the same time they have sought to expand trade with Western Europe following their policy of "peaceful coexistence." As reflected in Table VII, Soviet hard currency imports have increased from $2,708 million in 1970, to $26,017 million in 1980. Of special significance is the growing importance of fuels to Soviet hard currency exports. In 1970, they exported $493 million in fuels, or 22 percent of their total hard currency exports. In 1980, export of fuels amounted to $15,095 million, or 64 percent of the Soviet Union's hard currency exports. Figure 3 shows that spiraling world oil prices, rather than increased volume, account for this tremendous increase in the hard currency export of fuels.

TABLE VII

Soviet Hard Currency Trade
($ amounts in millions of U.S. $)

	Exports, FOB			Imports, FOB		
	1970	1975	1980	1970	1975	1980
Total of which:	2,201	7,835	23,489	2,708	14,257	26,017
Fuels	493	3,887	15,095	8	497	700
Crude/petro	387	3,276	12,028	8	497	700
Natural gas	13	220	2,706	0	0	0
Coal & coke	93	391	362	0	0	0
Machinery	140	560	1,388	927	4,503	6,039
Ferrous metals	129	167	246	279	2,567	3,469
Chemicals	67	256	765	208	742	1,565
Wood & product	365	712	1,476	84	214	203
Agricultural	205	572	478	615	3,56	8,800
Grain	22	3	0	101	2,323	4,400
Other	183	569	478	514	1,533	4,400
Consumer goods	76	215	152	260	436	745

Source: U.S., Congress, Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," p. 462.

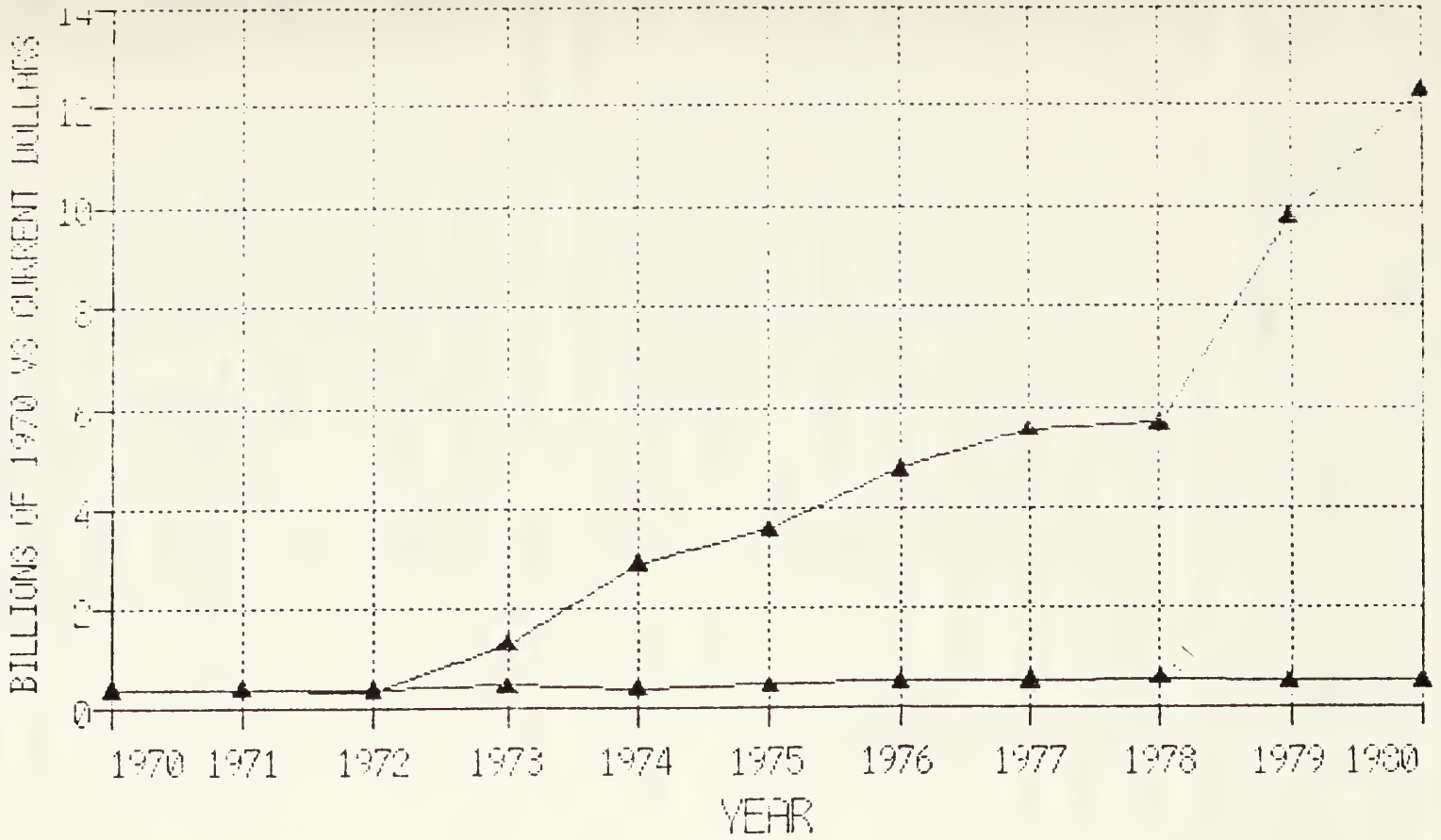

Figure 3. USSR: Hard Currency Exports. Source: U.S., Congress, Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," p. 482.

The trade patterns of West Germany, France, and Italy with the Soviet Union are generally representative of the Western European trade with the USSR. West Germany is one of the Soviet Union's most important Western trade partners. In 1981, West German-Soviet trade accounted for 15 percent of Western imports, and 21 percent of Western exports. Of this trade, fuels accounted for 77 percent of Soviet exports to the Federal Republic of Germany, while manufactured goods made up 71 percent of West German exports to the Soviet Union. Table VIII further delineates West German trade with the USSR.

Like West German trade, French trade with the Soviet Union has steadily increased, with an annual growth rate of about 25 percent between 1970 and 1980. In 1981, French-Soviet trade amounted to 12 percent of Soviet trade with the industrial West. Again fuels, at 83 percent, accounted for the largest import item from the Soviets, and machinery and equipment made up the largest part of French exports to the Soviet Union. Table IX capsulizes French Soviet trade.

In the early 1970's, Italy was in the forefront of expanding East-West trade, but as more technologically advanced markets in West Germany, France, Japan and the United States opened up, Soviet-Italian trade became less important. In 1981, Italy supplied the Soviet Union with about 5.5 percent of its imports from the industrial West. Italian imports from the Soviets amounted to about 14 percent of the Soviet Union's exports to the industrial West. Fuels once again led Soviet

TABLE VIII

West Germany: Trade with the USSR, 1981

Commodity	Million	Percent of Total to USSR	Worldwide
West German Exports			
Total	3,330	100.0	1.9
Agriculture	419	12.6	4.1
Raw materials	44	1.3	.9
Fuels	6	.2	.1
Manufactured	2,861	85.9	1.9
Chemicals	431	12.9	2.0
Semi-finished goods	1,165	35.0	3.6
Iron and steel	890	26.7	8.9
Machinery	1,142	34.4	2.4
Metal-working	281	8.4	8.1
Transport	60	1.9	.2
Consumer goods	63	1.9	.4
Other	0	0	0
West German Imports			
Total	4,040	100.0	2.5
Agriculture	34	1.0	.2
Raw materials	381	9.4	2.8
Fuels	3,112	77.0	7.8
Crude oil	271	6.7	1.2
Oil products	1,037	25.7	10.3
Natural gas	1,624	40.2	25.8
Manufacturers	394	8.6	.4
Other	164	4.1	3.3

Source:U.S., Congress, Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," p. 464.

TABLE IX

France: Trade with the USSR, 1980

Commodity	Million	Percent of Total to USSR	Percent of Worldwide
French Exports			
Total	2,464	100.0	2.2
Food and Agriculture	622	25.2	3.4
Energy	16	.6	.3
Chemicals	599	22.7	4.9
Metals	379	15.4	2.5
Iron and steel	359	14.7	3.6
Machinery and transport	681	27.6	1.7
Manufacturers	150	6.1	1.1
Minerals	19	.8	.7
Wood and paper	38	1.6	1.1
French Imports			
Total	3,556	100.0	2.6
Food and Agriculture	42	1.2	.3
Energy	2,722	76.5	7.6
Coal	85	2.4	4.7
Crude oil	1,585	44.6	6.1
Oil products	578	16.2	13.8
Chemicals	385	10.8	3.7
Metals	68	1.9	.5
Iron and steel	1	neg.	neg.
Machinery and transport	5[illegible]	1.7	.2
Manufacturers	133	3.7	.9
Minerals	11	.3	.3
Wood and paper	134	3.8	2.2

Source: U.S., Congress, Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," p. 466.

exports to Italy at 85 percent of the total exports, and manufactured goods led Italian exports to the Soviet Union. A breakdown of Soviet-Italian trade is provided in Table X.

TABLE X

Italy: Trade with the USSR, 1981

Commodity	million	Percent of Total to USSR	Worldwide
Italian Exports			
Total	1,289	100.0	1.7
Agriculture	111	8.6	2.0
Raw materials	91	7.1	2.2
Fuels	15	1.2	.2
Manufactured	1,079	83.2	1.8
Chemicals	102	7.9	2.0
Semi-finished goods	470	36.5	3.1
Machinery	409	31.7	1.8
Transport	46	3.6	.5
Consumer goods	45	3.5	.7
Italian Imports			
Total	3,105	100.0	3.4
Agriculture	14	.5	.1
Raw materials	246	7.9	2.7
Fuels	2,647	85.2	8.5
Crude oil	1,285	41.4	5.8
Oil products	289	9.3	5.7
Natural gas	1,057	34.0	44.4
Coal	17	.5	1.2
Manufactures	198	6.4	.4

Source: U.S., Congress, Joint Economic Committee, "Soviet Economy in the 1980's: Problems and Prospects, Part 2," p. 468.

In these three examples, Soviet trade with the West can be seen as important in selective industries, but not critical to the economic well-being of the nation. To insure this trade activity is in the proper perspective, it must be noted that in percentage of worldwide trade, it accounts for only 1.9 percent of West German exports, 2.2 percent of French exports, and 1.7 percent of Italian worldwide exports. In jobs, this equates to between 100,000 and 150,000 in work forces that total between 20 and 25 million. The importation of fuels from the Soviets, which accounts for seven to nine percent of each country's total energy needs, could prove to be a viable economic lever if alternative supplies cannot be guaranteed.

Even in the wake of Afghanistan and the Polish crisis, Western Europe has maintained the regional détente that had been established with the Soviet Union. Western Europe has continued to relax into deeper and deeper trade ties with Moscow. The Soviets proudly report the increased East-West European cooperation, citing the following 1983 trade developments:

> The Soviet Union is conducting the closest and most comprehensive trade and economic, as well as scientific-technical and industrial, cooperation with the countries of Western Europe. Commodity turnover with them in 1983 was 6.4 percent greater than in 1982. The Western European countries' share in all Soviet trade with industrially developed capitalist countries rose from 79 percent in 1982 to 82 percent in 1983.
>
> In 1983 Western European countries continued to cooperate with Soviet organizations in construction of industrial projects in the USSR. They delivered machinery and

equipment to the Soviet Union for certain enterprises of the chemical, metallurgical, pulp and paper, light and food sectors of industry, the building materials industry, the gas transport network, and the agro-industrial complex.

In addition, foodstuffs and consumer goods were imported from the countries of Western Europe. The large volume of export contracts signed by Western European companies with Soviet organizations led to a significant increase in the volume of Soviet imports from countries of this region; it increased by 11.3 percent compared to 1982. As a result of this, the share of Western European countries in USSR imports from the developed capitalist countries rose from 62 percent in 1982 to 70 percent in 1983.

There were significant increases in deliveries of goods to the Soviet Union from Spain (50.2 percent), Austria (47.1 percent), France (36.3 percent), the Netherlands (36.2 percent), Ireland (29.8 percent), Norway (41.8 percent), West Berlin (38.9 percent), Greece (26.3 percent), Italy (17.5 percent, Iceland (15.5 percent), and the FRG (14.7 percent). In payment for imported goods, the Soviet Union exported to Western European countries energy carriers, raw materials, and various types of machinery and equipment which they needed.

The FRG has been the USSR'S leading foreign trade partner among the Western countries in recent years. Trade with the FRG rose 5.9 percent compared to 1982. From the FRG the Soviet Union buys about one-fourth of all machinery and equipment imported from the capitalist countries, a large quantity of pipe and certain sections of rolled ferrous metals, as well as consumer goods. Natural gas, petroleum, and petroleum products have an important place in Soviet exports to this country. West German companies also import Soviet chemical products, lumber, ores, machine tools, electrical motors, motor vehicles, and other industrial goods.

Promising directions for deepening trade and economic cooperation between the two countries are detailed in agreements on the development of economic, industrial, and technical cooperation, and on further development of economic cooperation, which last year were extended to 1993.

Trade-economic, industrial, and scientific-technical cooperation with Finland is being developed on the firm foundation of the Treaty on Friendship, Cooperation, and Mutual Assistance, which last year was extended for the next 10 years, and trade-economic agreements, including the Long-Term Program for Economic Cooperation, which is calculated to 1995. The Protocol on Cooperation in the Field of Agriculture and Food Production will help develop cooperation with this country further. It covers practically all the stages

of the production and marketing of agricultural products and foodstuffs.

Trade with Italy rose 8.5 percent compared to 1982. The Soviet Union exported energy carriers and other goods needed by Italy. A broad assortment of machinery and technical goods were imported from Italy. The contract for production in the USSR of small agricultural equipment should be especially noted. It was signed with Italian companies last year. The intention of both parties to expand and diversify trade-economic relations in the future was reflected in the new long-range program agreed upon in 1983 for deepening economic, industrial, and technical cooperation in the period until 1990.

Soviet-French trade was developed actively in 1983. Its volume rose by 16.6 percent compared to 1982. Deliveries of energy carriers, which make up 86 percent of Soviet exports to France, increased. Imports of French goods, mainly agricultural products and industrial equipment, were substantially expanded. Supplies for development of the fuel and energy complex were a significant share of imports from France in 1983. In particular, a large order was placed last year for delivery to the Soviet Union of equipment for gas cleaning and refining at the Astrakhan gas condensate deposit.

Total commodity turnover with certain Western European countries such as Spain (68.6 percent), Ireland (30.6 percent, Sweden (17.7 percent), and Great Britain (16.0 percent) increased significantly in 1983. [Ref. 40: pp. 4-6]

The Soviet Union's traditional exports of fuel and raw materials remain as the mainstay of their exports. Over 45 percent of all Soviet exports in 1983 were in these catagories. (See Ref. 40: p. 8.)

The Soviet Union has continually tried to improve the level of its industrial exports. Most products are of such poor quality that they are not competitive on the world market. Soviet-built cars and tractors, which are considerably less expensive than Western competition, have lost favor because of numerous defects and a lack of spare parts and repair facilities.

[Ref. 41: p. 44] Table XI illustrates detected faults in tests conducted on the Moskvich 412 automobiles.

TABLE XI

Frequency of Detected Faults
in Moskvich 412 Models

(Nine cars tested)

Location of defect	Type of defect: Potential defect requiring remedial action	Defect to be put right at owner's convenience	Extreme defect requiring urgent attention	Extreme defect requiring immediate attention
Engine/cooling	2	8	0	2
Fuel/exhaust	1	1	2	0
Transmission	2	2	2	2
Braking system	0	1	3	15
Steering mech	0	15	3	11
Suspension/wheels	3	11	3	4
Body	14	4	1	0
Miscellaneous	6	3	0	1
Total	28	45	14	35

Source: Ronald Amann, et. al., The Technological Level of Soviet Industry, p. 555.

H. DUAL USE OF TECHNOLOGY TRANSFER

With consistently increasing East-West trade has come consistently increasing levels of technology transfer. According to Wayne Schroder,

> the COCOM embargoed list had already been substantially reduced from 265 items in 1954 to 149 items in March 1976. However, the growth of COCOM exception requests was so great that by 1978, 1,035 such requests were granted (in 1977, according to a report by the Office of Technology Assessment, 836 COCOM

exception requests were approved; only 31 were denied): nearly half of these requests (500) were made by the United States. [Ref. 42: p. 61]

Schroder goes on to provide some of the more obvious examples of the detrimental effect of dual-use technology transfer, citing the following:

--The 1972 sale of 164 Centalign-B precision grinding machines to the USSR. These machines, denied to the USSR in 1961, have been identified by Defense Intelligence Agency officials Edwin Speaker and Jack Vorona as having made a major contribution to the Soviet ICBM effort by enabling them to produce the precision miniature ball bearings needed to improve the Hard-target kill capability of MIRV guidance systems, including the heavy SS-18.

--Kama River Truck Plant. The transfer of assembly lines, foundries, molding machines and relevant computer technology to the Kama River Truck Plant project in the 1970's is another key example. These transfers, facilitated by direct, low interest export/import bank loans, were made despite DoD warnings that Kama could be used to manufacture military vehicles. By 1979, government officials testified before the House Armed Services Research and Development Subcommittee confirming that vehicle production and diesel engine production were being diverted for use in the Soviet military. Finally, conclusive proof of diversion came with acknowledgement by Undersecretary Perry in February 1980 that Soviet trucks manufactured at Kama were sighted in Afghanistan.

--ZIL. Soviet ZIL truck plants are not only important from a manufacturing standpoint, but also as a center for research for the entire Soviet automotive industry (particularly the Moscow plant). Military vehicles manufactured at ZIL plants include the ZIL 131 military truck, missile launchers and armored personnel carriers. Computer and spare parts sales to ZIL have been major sources of technology transfers in the past.

According to Brady, the United States had exported $12-13 million worth of computers and spare parts to ZIL factories.

--Oil and Gas Technology. In Fall 1978, the Carter administration approved some 74 export licenses for the sale of oil and gas exploration and drilling

technology to the Soviet Union. The most important sale was the one involving the export of $144 million oil drill bit factory by Dresser Industries to the USSR. A Defense Science Board Task Force, Secretary of Energy Schlesinger and members of the National Security Council all recommended against the Dresser sale, on grounds that it would ease Soviet energy requirements, thus freeing resources for use in the military sector; that its computerized electron beam welding machine could be used to manufacture jet aircraft, and that the tungsten carbide used to produce the drill bits could be used to manufacture armored-piercing projectiles. Former National Security Council member Samuel P. Huntington has noted that it has been estimated that Soviet oil production would be 10-15 percent less than it is, were it not for Western exports of oil and gas equipment and technology to the USSR. (See Ref. 42: pp. 62-63.)

It is obvious from these examples that the transfer of military and dual-use technologies can adversely affect the military position of the West and its allies. However, similar technology is available throughout the industrial West.

It must therefore be noted that to be effective, any policy on East-West trade and technology transfer must be accepted by all members of the alliance; it is futile to embark on a policy in this area that is not fully supported by all Western industrial countries. The weaknesses inherent in the use of economics as a political lever against the Soviet Union were vividly demonstrated by President Carter's failed grain embargo, and President Reagan's ineffective embargo of pipeline equipment. According to some sources, this equipment was available from over 300 other suppliers in Western Europe.

With Western Europe's voracious appetite for trade with the East, any policy adopted that severely restricts individual

members of the alliance will undoubtedly prove unacceptable. Considering the East European's and the Soviet's varied but real internal technological capabilities, the fundamental emphasis on a Western trade and technology transfer policy should be directed at the protection of emerging technology with close military applications; any extension of this policy will in all probability prove to be unworkable and counter-productive. "In a global economy of physical scarcity," Secretary of State Henry Kissinger said to the Sixth Special Session on the United Nations General Assembly in April 1974, "science and technology are becomming our most precious resource." [Ref. 43: p. 1] The export of this resource from the United States to the Soviet Union is mired in political, strategic, and economic uncertainty.

IV. SOVIET THIRD WORLD TRADE

A. ECONOMIC AND POLITICAL MOTIVATION

Like trade with the West, the Soviet Union's motivation for expanded trade with the Third World is based on both economic and political gain. In Soviet terms, they see opportunities for expanding mutually beneficial economic cooperation with the newly free countries of the old colonial and neo-colonial empires in light of the developing countries' desire for independence, and the economic growth of the Socialist countries. Through this beneficial cooperation, these newly freed countries which are developing their society and political parties as well as their economies will, in the Soviets' view, "welcome with understanding the policy pursued by the Soviet Union and the Socialist's community as a whole, and will actively promote friendship and cooperation with them." [Ref. 44: p. 251] The Soviets profess that the Third World countries are their natural allies against the neo-colonial United States.

Moscow has placed special emphasis on the extension of their power and influence in the Third World. They see the inevitable collapse of the neo-colonial system as a prelude to the collapse of capitalism. As Karen Brutents, a leading Soviet Third World expert, has pointed out:

> For the Soviet Union, relations with the newly free states are particularly significant because of

> the historic role these relations have played and continue to play in liberating these countries from colonial and neo-colonial oppression, in consolidating their independence, and ensuring their economic sovereignty. This is also connected with the community of similarity of the vital interests and goals of the Socialist and newly free countries in international relations. In today's world, expanding relations with the newly free countries is one of the Soviet Union's principal foreign policy objectives. (See Ref. 44: p. 239.)

To meet this foreign policy objective better, the Soviets are expanding their economic relations with the Third World. The Soviet apparatus can be particularly effective in making immediate decisions to supply military equipment, and economic aid or to engage in barter deals, depending on the political expediency of the moment. [Ref. 45: p. 83]

The significance of the Soviet Union's capabilities and methodical movement into the international marketplace should not be underestimated. The Soviet Union has the second largest gross national product in the world. Through the effective integration of the East European economies, beginning in the mid-1960's, the Soviets now control a giant economic machine named the CMEA. According to economist Bhedan Oszuprowicz, in 1978 the gross national product of the CEMA member countries was 23.2 percent of the world GNP, compared to the United States' 21.8 percent share, and the European Economic Community's 20.2 percent share of world GNP. (See Ref. 45: p. 55.)

As the Soviet Union exhausts its supplies of unrecoverable natural resources, it will by necessity compete with the West in the Third World for those products. Today, the Soviet Union remains essentially self-sufficient in most minerals,

and can selectively enter markets based on opportunity cost, or political expediency. This selective capability is in stark contrast to the dependent nature of Western Europe, Japan, and the United States on Third World markets for many essential items. In Lenin's view, the fundamental weakness of the capitalist system was its dependence on the colonies and the developing world. The road to London stretched through New Delhi and Peking in 1920, as the road to Washington now stretches through South Africa, Saudi Arabia, Venezuela, and Mexico.

B. U.S.-THIRD WORLD TRADE

The importance of foreign trade to the United States national economy had remained small until the end of World War II. The defeat of Nazi Germany in Europe, and the defeat of Japan in the Pacific left the economy of the United States in an expanded condition in search of new outlets for production. These outlets were found in both Europe and the former colonies of the now-dismantling old European empires. Post-war American policy was directed toward the ideal of free trade and a steady expansion of capital investment and consumption. Even the "backward" nations, through a slow evolutionary process, could eventually support capital-intensive industry. For the United States, more trade meant more jobs, lower prices, and higher incomes.

The United States' push for free trade and new markets to accept our overproduction after WWII was successful. By

1960, the United States' annual import-export trade was $35 billion, and mushroomed to $507 billion by 1981, making the United States the largest trading nation in the world. Our initial need for trade after World War II has developed into a dependence on trade.

In 1981, the United States imported $273 billion worth of goods, nearly one-fifth of the raw material that we consumed. These imports included chromium, cobalt, industrial diamonds, and, of course, petroleum products. The disruptive and crippling effects of the 1973 OPEC oil embargo vividly demonstrates the United States' dependence on foreign trade, especially Third World trade. Increasingly more important, but much less visible, is the United States' dependence on the Third World for strategic and critical minerals. A 1980 report by the Subcommittee on Mines and Mining of the U.S. House of Representatives states that:

> America is now dependent on foreign sources in excess of 50 percent for 24 of 32 minerals essential to national survival. Minerals such as manganese - essential in the production of steel (import dependence 98 percent); cobalt - vital hardener and strengthener of steels (import dependence 95 percent); and chromium - indispensable to the production of stainless steels and the least substitutable of all ferro-alloys (import dependence 90 percent) reveal a vulnerability more serious than the energy crisis. While America may develop its own alternative energy resources, in many cases there are no substitutes for the minerals imported from foreign sources, countries which are often unstable at best, hostile at worst. (See Ref. 3: p. VII.)

The distribution of important minerals and energy sources among Third World countries indicate that in many areas, the

United States and the Soviet Union's dependence on trade with the Third World will continue to increase. Table XII shows the distribution of selected mineral and energy sources by groups of countries.

TABLE XII

Distribution by Groups of Countries of the World Output of Selected Mineral and Energy Sources

(percent of world output)

		Developed market-economy countries	Developed centrally planned economies	Developing Countries
Copper	1970	41.7	16.7	41.1
	2000	23.3	8.7	68.0
Iron	1970	39.1	29.4	31.5
	2000	22.9	34.4	42.7
Petroleum	1970	25.7	16.1	58.2
	2000	20.2	14.7	65.1
Nat Gas	1970	71.4	21.6	17.0
	2000	38.8	36.5	24.7
Coal	1970	46.7	29.5	23.8
	2000	44.8	25.0	30.2
Nickel	1970	50.4	17.7	31.9
	2000	16.5	19.0	64.5
Zinc	1970	58.5	17.0	24.5
	2000	64.0	-	35.2
Lead	1970	50.0	23.5	26.5
	2000	43.2	23.0	33.8

Note: Petroleum and Natural gas in Coal-equivalent

Source: [Ref. 46: p. 9]

The table clearly indicates that both the West and the Eastern bloc will become increasingly dependent on the Third World for most of the commodities listed. The United States' continued support for a policy of free trade now finds

rationale in the necessary maintenance of trade with the Third World for economic well-being rather than in the desire to increase markets. Correspondingly, the import lead trade policies of the Soviet Union will, through necessity, require an upward adjustment of exports to meet increased imports from the Third World.

Current United States policy stresses that increased trade is the most important force in promoting the economic growth of the less-developed countries. For most less-developed countries, trade, rather than official aid, is the main source of foreign exchange, and the primary external factor in economic progress. The ability of the less-developed countries to buy the goods they need for their development is dependent to a large extent on expanding their exports. (See Ref. 46: pp. 1-2.)

One method of increasing exports is through direct foreign investment. But with the rash of civil wars and expropriation in the Third World during the period 1950 into the 1980's, U.S. investors were reluctant, and remain reluctant, to make long term investments in what is still an unstable area. United States businessmen are not only concerned with the dangers of war and expropriation in the Third World, but also the level of a country's external debt, balance of payments, domestic investment, domestic competition, labor unrest, exchange controls, U.S. regulatory requirements and many more things, all of which have added disincentive and uncertainty to U.S. business investment in the Third World. [Ref. 47: pp. 17-22]

Combining with these economic strains is the success of the United States' past foreign economic policy in rebuilding of the West European and Japanese economies after WWII. This success is now seen by American industry in the form of stiff foreign competition in traditional United States markets. European and Japanese quotas, tariffs, barriers, and direct government subsidies have caused American business to call foul, and have advocated similar United States governmental measures. Robert B. Reich, writing in Foreign Affairs noted that:

> The European Community maintains a tariff of 17 percent on integrated circuits. Australia, South Africa, Spain, Mexico, and 26 other nations require fixed percentages of domestic content in automobiles assembled within their borders. France is restricting imports of video tape recorders by subjecting them to detailed inspections and deliberate delays. Some government subsidies are being devoted to older industries. Over the last five years, the European Community has invested more than $30 billion in steel. Other subsidies are being directed at emerging businesses. In 1982, Japan unveiled two programs that together devote $750 million to pursuing world leadership in developing and producing the next generation of computers. Japan's $200 million project to develop very large-scale integrated circuits already has enabled that nation to take the lead in that field. France is spending $20 billion on electronics over the next five years; Germany and France together are investing heavily in satellite technology. [Ref. 48: p. 784]

In response to these pressures, the United States Government has, while still a proponent of free international trade, countered with many of the same protectionest techniques used by other industrial and developing countries. The United States, for example, reimposed duties on $3.8 million worth of imports from Hong Kong, South Korea, Taiwan, Brazil, and

Mexico, as well as increasing protection of U.S.-made car parts, electrical goods, fertilizers, and chemicals. [Ref. 48: p. 785]

Faced with these strong competitive forces in the international marketplace, the gradual emergence of the Eastern bloc as a new player with new rules will continue to place additional strains on the present system of international trade. In a weakened world economy with many already strained economic and political relations, this new competitive force could break more than 35 years of relatively positive economic cooperation and free world trade. The economic disruption of a trade war would undoubtedly weaken the United States far more than the traditionally economic independent Soviet Union, and serve to drive Third World economies closer to the Eastern bloc.

C. RECENT SOVIET-THIRD WORLD TRADE

The closed nature of Soviet society prevents a full and complete assessment of all the rationale involved in Third World trade relations. Whether recent Soviet trade developments represent state economic decisions based on opportunity cost, or attempts to disrupt free trade and deny the West access to former markets, is an important question. Whatever the answer, their actions represent Soviet movement into Third World markets, at the competitive expense of the United States.

In 1983, the Soviets reported trade with 144 countries, and specified that 102 of these trading partners were developing

countries. [Ref. 49: p. 12] Appendix D lists selected countries' trade with the Soviet Union in 1982 and 1983. It demonstrates the relative Soviet trade growth and influence in those countries. This partial listing of Soviet trade involvement illustrates not only the degree of Soviet economic involvement, but also in the case of Libya, Saudi Arabia, Iraq, Iran, and others, the Soviets' search for new sources of energy. Soviet foreign trade shifts in Iran, while certainly demonstrating an increasing presence since the United States' departure, may also be an indication of Soviet shifting support to Iran from Iraq in those two countries' continuing conflict. Such use of economic power to influence the political events in another country is, of course, not in keeping with the Soviet Union's declared policy.

The Soviet Union constantly stresses that its interest in trade with Third World countries is based solely in the interest of mutual benefit. A recent article in the Moscow news stated that:

> ...the policy of the Soviet Union rules out any attempts to use economic cooperation for imposing its will on any other country, or to seek advantages for itself in the economic difficulties other states are experiencing. This is incompatible with the principles of USSR foreign policy, and with the interests of peace, international seucrity, and the strengthening of friendly relations. [Ref. 50: p. 43]

Yet in 1948, Yugoslavia's oil imports from the Soviet Union were cut by 50 percent, and stopped completely with Tito's break from Moscow. In 1956, Soviet oil shipments to Israel were halted with their invasion of the Sinai. In 1958, Soviet

oil shipments to Finland were stopped until a President more in line with Moscow's policies was installed. With the surfacing of the Sino-Soviet dispute in the mid-1960's, oil shipments to China were halted. And in 1968, oil shipments to Cuba were delayed when Castro became too independent. [Ref. 51: p. 139]

Soviet sources point out that they had governmental agreements with 64 developing countries in 1980, compared to 54 in 1975. Such cooperation was maintained with 21 countries in Asia, 33 in Africa, and 10 in Latin America. In terms of volume, the USSR's economic and technical cooperation with the developing countries, provided by the agreements signed, rose by 760 percent between 1960 and 1980, including a 570 percent growth in aid to Asian countries, and a 1,200 percent growth in aid to African countries. This incredible growth in Soviet economic and technical cooperation can, in part, be explained by events in Vietnam, Kampuchea, Afghanistan, Angola, and Ethiopia.

Deliveries of Soviet complete plants to the developing world rose from 63.6 million rubles in 1960, to 794 million in 1980. Under agreements, the Soviet Union helped the developing countries to build more than 1,190 industrial and other projects--600 had been completed and put into operation as of January 1981. [Ref. 52: p. 13]

Soviet economic cooperation with the developing countries embraces a wide range of industries and economic sectors, but concentrates on industrial development. (See Ref. 44: p. 253.)

Table XIII demonstrates the type of projects in which the Soviets are engaged. Typically the recipient country is required to make payments for the project by supplying the Soviet Union with a portion of the facilities production, or by supplying traditional goods. Soviet aid is thereby used to boost trade.

TABLE XIII

Total Production Capacity of Cooperation Projects

(as of January 1978)

	Unit of measurement	Planned by agreements	Put into operation
Power station	mln.kw	19.37	7.3
Pig iron	mln.ton	26.95	10.77
Steel	"	26.10	9.73
Rolled stock	"	21.68	7.47
Iron ore	"	13.00	13.00
Coal (production)	"	50.27	4.80
Oil "	"	66.00	66.00
Oil (refining)	"	23.00	11.60
Bauxites	"	2.50	2.50
Mineral fertilizer	"	0.105	0.105
Land irrigation and drainage	thous ha	738	156
Railroads	km	2,099	1,709
Highways	km	2,105	2,085

Source: Karen Brutents, The Newly Free Countries in the Seventies, p. 252.

The following reported trade protocol between the USSR and India typifies a Soviet-Third World non-oil producing agreements.

> Last December a Protocol on Trade Turnover between the USSR and the Republic of India for 1984 was signed in New Delhi. The Protocol provides for a 10 percent trade growth above volumes agreed for 1983 through the expanded shipments of traditional export and imports and additions of new goods to the trading list. Increased shipments to India of a number of Soviet goods is planned; they include machinery and equipment, fertilizers, newsprint.
>
> Soviet main imports from India will include cotton fabrics, jute articles, raw material and semi-manufactures for the tanning and footwear industries, knitwear and clothes as well as tea, coffee, tobacco, spices, and other agricultural produce.
>
> The Protocol envisages greater Soviet purchases of Indian national industry's products such as cable articles, electronic instruments and components, equipment for the dairy industry.
>
> The volumes of many Soviet and Indian goods coordinated in the Protocol for 1984 considerably exceed the figures for 1984 in the 1981-1985 Long-Term Trade Agreement, which, taking into consideration the results achieved in mutual trade during the 1981-1983 period will ensure the successful implementation of the Agreement. (See Ref. 52: p. 5.)

Additional examples of Soviet Third World economic and military aid are provided in Appendix E [Ref. 53: pp. 194-204].

The Soviet Union's expansion of Third World trade has been assisted by foreign-based Soviet firms established to promote Soviet products and services. The number of these firms grew from only 28 in 1970, to 84 by 1976. (See Ref. 45: p. 84.) To facilitate these firms in their goal to increase trade, the Soviet merchant marine has grown to become the largest in the world in number of ships. The Soviet Union has over 1,700 ocean-going cargo ships, and is tied at sixth place with the United States, which has 500 merchant ships, in total carrying capacity. The Soviets have directed the

development of their merchant fleet toward relatively small multipurpose tankers, and high-speed Roll/on Roll/off combination ships. This development enables the Soviets to compete effectively in Third World countries which have less-developed and shallower port facilities. Additionally, the Soviets do not participate in shipping conferences which establish rate structures and are able to undercut the set schedules by 20 percent or more. (See Ref. 45: p. 84.) This provides added incentive for Third World countries to participate in trade with the Soviets. The Soviet Union's large merchant fleet is extremely valuable in their expanding trade ties with the Third World, and is effective projection of Soviet influence.

D. THIRD WORLD DEBT

The current Third World external debt and trade deficits have also strengthened and assisted the Soviets' entry into many formerly closed Third World markets. While Mexico, Brazil, and Argentina lead the world in total external debt, other Third World nations are not far behind. Foreign debt has become the controlling factor in many Third World economies. Faced with high interest rates, high import costs, and low commodity prices, many nations are finding it more and more difficult to service their national debt. As more hard currency is needed for this purpose, less is available for imports and capital investment. One solution which is gaining in popularity among Third World debtor nations is the use of counter-trade to increase exports and imports.

Indonesia was the first Southeast Asian nation to institute a counter-purchase policy in January 1982. Counter-purchase or counter-trade is somewhat different from straight barter. Usually only part of the agreement is in the form of direct exchange of goods, and often there is more than one country involved in the transaction. In Indonesian policy, a 100 percent counter-purchase was required on all non-oil or gas products purchased overseas, with a 50 percent penalty against unfulfilled obligations [Ref. 54: p. 49]. This stiff counter-trade policy met with initial resistance in Japan and other countries, but negotiated agreements have been reached which satisfy all parties. In 1982, Malaysia also accepted counter-trade as a "useful method of trading with East European countries." [Ref. 55: p. 50] Agreements have been reached for the exchange of Malasian rubber and petroleum for two South Korean-built naval vessels, palm oil for Pakistan railway equipment, and Mexican cocoa beans for rubber (see Ref. 55: p. 52).

Thailand has thus far limited its barter trade to the exchange of Thai farm products for agricultural-production materials. Its first formal barter agreements were with the Soviet Union, Romania, and South Korea, exchanging maize and tapioca chips for fertilizer. [Ref. 56: p. 52] At one point in the recent Thai-U.S. negotiation on the purchase of F-16's, it was suggested that at least part of the purchase be paid for in commodities. The Philippines, faced with the same debt

problems and low commodity prices as others, has been utilizing counter-trade with the Soviet Union and other East European countries in the export of coconuts and sugar. They are currently negotiating payments for a proposed one million ton-a-year coal-fired cement plant with the Soviets. It is reported that:

> Moscow is Manila's largest buyer of sugar. The Philippines has been trying to negotiate long term contracts with the Soviets for some time (at present, most purchases are done on a ship-by-ship basis). Existing long term contracts with futures brokers have been the saviour of the sugar industry locally during the current price depression, though these will expire at the end of the year. If counter-trade negotiations for the cement plant contain a sugar component, the local industry may breathe easier, and the Soviets will have their first major industrial project within Asia. [Ref. 57: p. 54]

It is currently estimated that counter-trade comprises 20 to 30 percent of all world trade [Ref. 58: p. 55]. This figure will undoubtedly grow as long as the current world economic slowdown continues, interest rates remain high, and commodity prices stay low. Runaway inflation, as high as 1,000 percent a year in some Third World countries, also destabilizes traditional free trade and encourages counter-trade. The admitted inefficiencies and trade disruptions created by counter-trade will be accepted because there is no present alternative. The Soviet Union and other CMEA countries which have experience and have established infrastructure to handle the demands of counter-trade will benefit the most from its continued growth.

E. SOVIET MILITARY AID

With increased trade and aid, the Soviet Union is expanding its influence in the Third World. The importance of the economic base in the Soviets' thrust into the Third World will continue to grow. It is needed to balance and stabilize the military aid given to Third World countries. Economic assistance provided by the Soviet Union is now dwarfed by the military assistance. Figure 4 graphically demonstrates the continuing disproportionate reliance of the Soviet Union on military arms supply to the developing states. Kremlin leaders recognize that while economic integration will foster long term stable relationships, what is needed to support Third World military coups is military aid. Soviet international problems specialist G. E. Mirsky wrote in 1976 that:

> In the past 15 years alone, about 30 countries have produced approximately 40 successful military coups. This shows that military intervention in the politics of a country in the Third World has become the usual practice. In a lot of countries of Asia, Africa, and Latin America, power falling into the hands of soldiers is not an exception--it has become the rule.
>
> But until the beginning of the 1960's, our scientists were not studying it; only recently have these social forces become an object of study because their social impact on the life of the country has become quite clear. (See Ref. 11: p. 73.)

Commonly in Third World revolutionary situations, the immediate needs of a new government, fearful of internal and external threats, are satisfied by Soviet military assistance. Immediate military aid is often essential to a new regime's continued survival. Similar assistance from the United States,

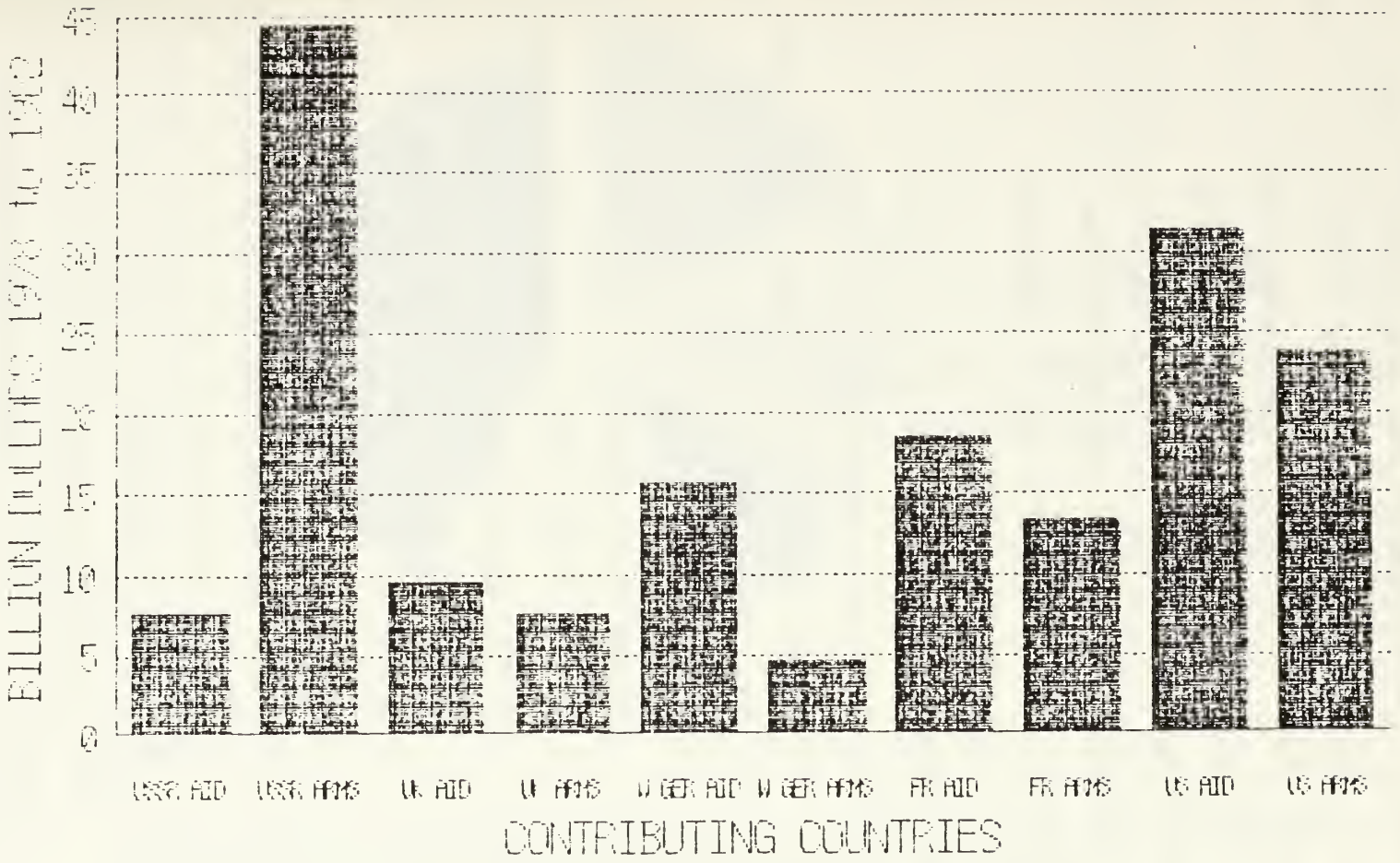

Figure 4. Arms-aid to Developing States. Source: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers 1972-1982, p. 9.

a status quo power often aligned with the previous government, is unlikely. Additionally, the acceptance of Soviet military aid, by a new regime, will in itself often malign United States' political leaders, making U.S. political and economic assistance more difficult, if not impossible, to obtain.

The structure of Soviet heavy industry with its emphasis on the industrial-military complex provides the Soviet Union with a comparative advantage in the production of military hardware. While the economy is not well-suited to satisfying consumer demands, its stress on heavy industry is ideal for the production of conventional military hardware (see Ref. 51: p. 119). With this comparative advantage, the Soviets are able to capitalize on the hard currency sale of arms to many oil-rich Middle Eastern countries. Figure 5 shows that the Middle East imported 41.9 percent of the total world arms transfers. Since 1977 the Middle East has led all other regions in arms imports. Soviet arms imports to the region were led in 1982 by Iraq with $4.3 billion, followed by Libya at $2.4 billion, Syria with $2.3 billion, and Algeria with $1.1 billion of imported Soviet arms (see Ref. 12: p. 7).

Soviet military assistance combined with Marxist-Leninist ideology and a centrally controlled governmental system gives added assurance to the maintenance of power by revolutionary leaders. While a vanguard party and massive military assistance go a long way in establishing Soviet influence, it is through economic integration and subsequent economic dependence

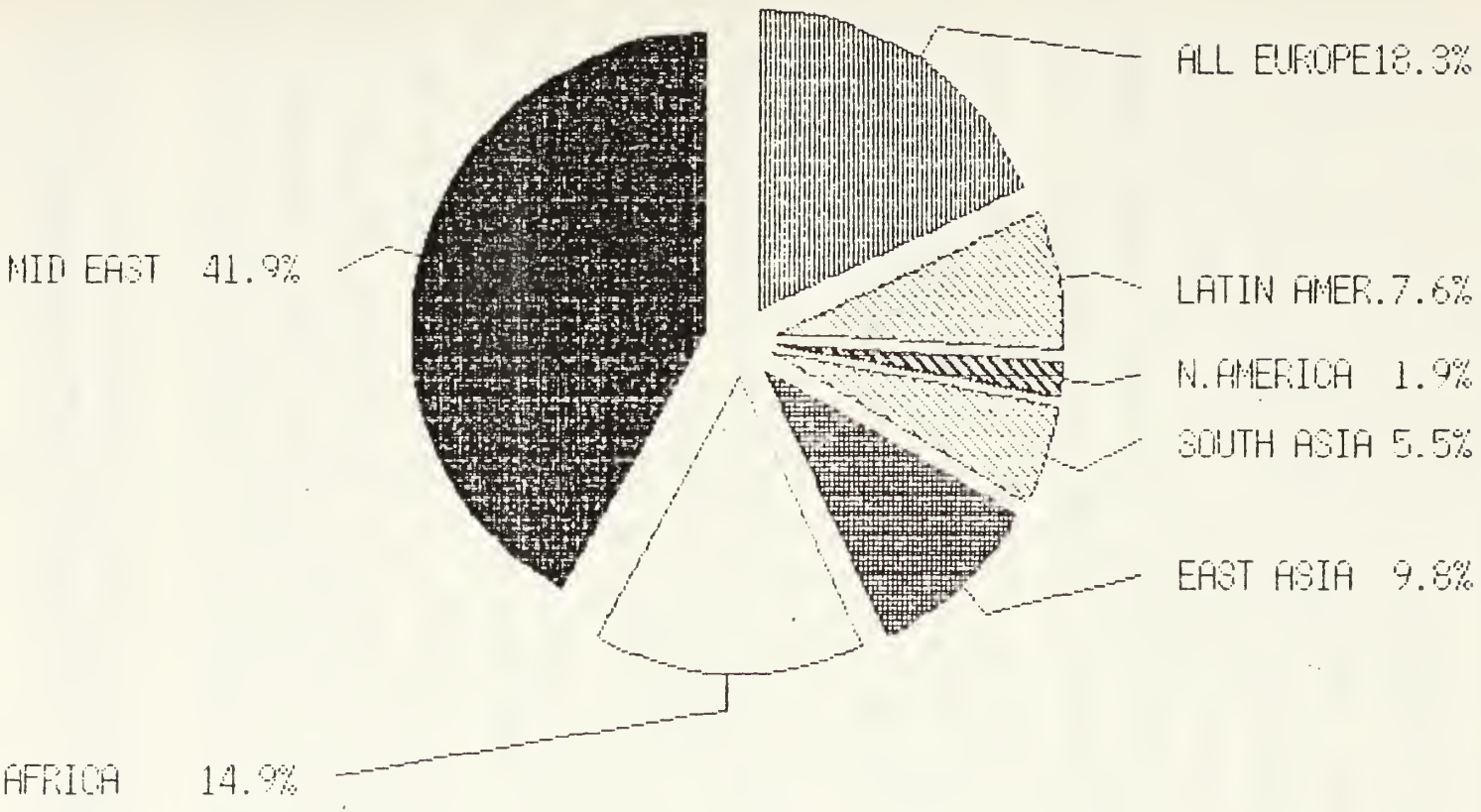

Figure 5. World Arms Imports, 1982. Source: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers 1972-1982, p. 6.

that nations are reliably bound to the Soviet Union. The mechanics of this integration is found in the Council of Mutual Economic Assistance. Eastern Europe, Cuba, and Vietnam give testament to this bond.

F. CURRENT DEVELOPMENT

The United States and the Soviet Union's dependence on Third World countries for the importation of vital raw materials can only increase with time. This growing dependence is inescapable if current levels of production and standards of living are to be maintained. It has been estimated that the United States imports over a quarter of the raw material used in production, and that the Soviet Union imports in excess of 11 percent of its raw materials for production. (See Ref. 51: p. 131.)

Direct economic and military aid from the United States Government is shackled with administrative requirements and often specifically directed at narrowly defined areas. The central control of the Soviet Union enables the immediate and complete committment of military and economic assistance to a Third World country. Soviet motivation for Third World assistance does not require public deliberation or public support. Former President Richard Nixon offered this assessment of Soviet motives in South Africa and the Third World in general.

> If the USSR continues to succeed in its penetration of Africa, it will have come a long way in its larger strategy of encircling the world "city--of

cutting off the industrialized West from the resources without which it cannot survive. Even the resource-rich United States depends heavily on imports for several of the basic minerals vital to modern economy. Chromium offers an example of the hidden dangers of this dependency.

Most people, when they think of chromium, think of the fancy trim on automobiles. But to strategic planners chromium means such things as ball bearings, precision instruments, and missiles. A single jet aircraft requires more than 3,600 pounds of chrome. As one expert has put it--"If you don't have chrome, you don't have top quality aircraft engines." Stainless steel cannot be made without chromium. The National research Council recently concluded that the U.S. long term vulnerability in chrome is greater than in petroleum. Chromium is already in short supply, and we desperately need it to rebuild our armed forces. Our domestic supplies of chromium ore are small in quantity and low grade in quality; 92 percent of our chrome must be imported.

And our two principal sources have recently been South Africa (33 percent) and the Soviet Union (25 percent. Furthermore, of the world's known resources of chromium, 96 percent are in South Africa and Zimbabwe. This vital dependency illustrates why the Soviets have particularly targeted for interference that portion of the continent that intensely engages the emotions of many in the West: southern Africa. The Soviet Union seldom acts without a purpose, and its purposes are always strategic, never moral....By one authoritative estimate, the Republic of South Africa alone possesses a tenth of the world's asbestos, three-fourths of the world's chromite ore, more than half of its platinum group metals, half of its gold, a third of its diamonds: a mineral treasure of almost incalcuable strategic and economic importance.

If South Africa were to fall under their (the Soviets) control, they would control the sealanes around the Cape, through which 70 percent of the strategic raw materials, and 80 percent of the oil needed by European NATO powers flow. South Africa is also the continent's leading economic power. It alone provides 40 percent of the industrial production of all Africa, and 25 percent of its agricultural production. [Ref. 59: p. 6]

President Nixon's assessment of the Soviets' motives and the import dependence of the United States is strengthened

by recent reports that the Soviet Union is now purchasing lead, copper, zinc, aluminum, molybdenum, and petroleum in large quantities. Yet the Soviet Union is self-sufficient in all these items. The Soviets have also reduced exports to the West in nickel, vanadium, lead, manganese, chrome ore, asbestos, and platinum (see Ref. 59: p. 6). Again whether these Soviet actions represent a state economic decision based on opportunity cost or an attempt to deny the United States access to these minerals is an important question. Whatever the answer, their actions represent the Soviets' movement into Third World markets, at the competitive expense of the United States.

V. CONCLUSION

A. CONTINUING NEED FOR TRADE

The Soviet Union will maintain its economic and trade ties with the Western industrial countries and expand these relations with the Third World. The Soviet Union's growing trade relations have proven both economically and politically advantageous. They have effected the continuation of regional détente in Western Europe, which enables Soviet access to the latest technology from West Germany, France, Sweden, Italy and Great Britain. They will continue to foster Third World trade to obtain raw materials, grain, energy products and markets. Since the early 1970's, the Soviets have emphasized the "international division of labor" as one of the principal means to enhance the economic well-being of the Soviet Union (see Ref. 11: p. 85). In his summary report to the XXV Congress of the CPSU, Brezhnev said:

> One of the characteristics of our age is the use of the international division of labour to develop each country to an increasing degree, no matter how much wealth nor what the economic level. We are devoted, as are other countries, to using foreign economic relations in order to mobilize greater potential for the smooth and successful completion of economic tasks and to increase the effects of greater productivity and speed up technical progress. (See Ref. 11: p. 85.)

This represents the second major shift in the Soviet's outlook on the world economy since the death of Stalin. In Stalin's time, the world economic system was viewed as

consisting of two separate economic systems, which could only clash with each other. Under the leadership of Khrushchev, the idea that there were two separate systems continued, but competition between the systems could exist under the conditions of "peaceful coexistence." The ideological evolution of Soviet economic thought shifted again with Brezhnev in the early 1970's. With the maturation of his concept of international division of labor there exists one world economic system with two subsystems--the socialist world economy and the capitalist world economy. Interaction between these two subsystems is desirable when it contributes to the strength of the Soviet Union. (See Ref. 11: pp. 83-84.) The binding autarkic shackles of Stalin's foreign economic policy were thus loosened under the leadership of Khrushchev, and thrown off with Brezhnev's ideological shift to the international division of labor. These shackles still lay at the feet of Kremlin leaders, restricting a dynamic leap into world markets.

The continued expansion of Soviet world trade will not go on unabated. There are limits to the Soviets' capability to foster increased trade. These limits come from within the Soviet political-economic system itself, and from their Western and Third World trading partners.

B. TRADE LIMITS FROM WITHIN THE SOVIET SYSTEM

Through history and communism, Russia is tied to a centralized planned and controlled economic system. This centralized control has created an enormous bureaucratic mechanism which

is not only sluggish and wasteful, but also requires compromise and concession throughout the system. In addition, the Communist ideology of the Soviet Union internally strives for the maintenance of the status quo. This struggle for stability has fostered the economic stagnation of the Soviet Union which restricts increased world trade.

The Russian cultural fear of things foreign, and their paranoic security concerns fostered by countless foreign invasions, also serves to restrict the dynamic entry of the Soviet Union into world trade. Their preoccupation with the military industrial complex, its security and self-sufficiency thwarts the diffusion, or spillover, of technology into other areas of the economy. The cycle created by uneven levels of technological development accelerates the growing gap in the technological development between the military and other sectors of the economy making many Soviet finished products unacceptable in the world market. With these inherent structural barriers to the development, introduction, and diffusion of technology, the Soviet Union has in some areas closed the technological gap, and in others surpassed the West. (See Ref. 13: p. 27.)

The current levels of Soviet technological capabilities dispel the assumption that the Soviets are totally dependent on the West for the introduction of new technology. In the case of the U.S. embargoed pipeline equipment, it is obvious that the Soviets had the capability to produce the equipment

necessary for completion of the pipeline. The Soviet decision to buy Western equipment in this instance was based on opportunity cost rather than on capability. This provides further evidence that the Soviets are capable of implementing the highest levels of new technology. It again indicates that the development of Soviet technology is most dependent on the State's priorities.

In recent years, the Soviet Union has only imported between four and six percent of its total domestic investment in plants and equipment (see Ref. 13: p. 29). This is a lower figure than that of any Western industrial country, and represents, in part, the Soviets' capabilities in the development of new technology. The uneven nature of Soviet technology serves as an incentive to increase high tech imports from the industrial West, and as disincentive to the export of Soviet finished products. Therefore, in the near future, the Soviet Union will have to rely on their traditional exports of fuel and raw materials for the mainstay of their exports. Over 65 percent of all Soviet exports in 1983 were in these categories (see Ref. 40: p. 8).

The Soviets will continually try to improve the level of its industrial exports. Most products are of such poor quality that they are not competitive in Western markets. In Third World markets, these industrial exports oftentimes compete with products from other developing nations. This Soviet-Third World competition is not conducive to the expansion of Soviet world trade.

The present and major emphasis for the continued economic growth of the Soviet economy in the 11th Five-Year Plan is the intensification of existing resources through the introduction of new technology. This emphasis itself demonstrates a system unwilling to accept real change or reform in the centralized control and management of the economy. Many Western and some Soviet specialists suggest that the Soviet's economic system needs real change in the form of decentralized control, yet they continue on the same familiar path, attempting to bolster the system by better, more stringent control, and the introduction of new technology.

The consistent lack of success in the current Five-Year Plan will undoubtedly place additional stress on the Soviet system. With continued reduced growth rates, downward adjustment of capital investment, military expenditures, more consumer goods will be required. If the Soviet socio-economic system continues in its resistance to change, the historical burden of this reduced economic growth will fall on the shoulders of the people.

Almost 20 years ago, a leading Soviet Party official wrote:

> The resolution of many economic problems now facing our country requires a further increase in the well-being and culture of the working people, an increase in the material and cultural benefits offered them by society. Naturally it is possible, based on the revolutionary enthusiasm and high consciousness of the people, and on their internationalism to conduct matters in the course of a relatively brief historical period so as not to raise the living standard, but at the same time to engage in successful economic construction. But no kind of high-consciousness permits the transformation of such a situation into a permanent

> state. The economic laws will inevitably prove to be stronger; they will begin to take revenge, they will revenge themselves in a thousand ways, and in the end there will be a drop in labor productivity and a slowing down of economic development. (See Ref. 6: p. 153.)

Given the apparent tolerance of the Soviet people with their faith and support in the government, it is not reasonable to assume that any fundamental changes will evolve from the economic slowdown in the Soviet Union. The Soviet people are an integral part of a system afraid of change.

A critical reevaluation of economic policy may emerge from a continued decline in economic growth, but a shift in economic priority from the military sector to the consumer sector seems inconceivable in the face of a U.S. arms buildup. The Soviets have stated that:

> The Soviet Union and its allies--the Socialist community countries--cannot overlook the facts of the imperialists' buildup of their military arsenals. They have to pay due attention to defense. The USSR Supreme Soviet session deemed it expedient to maintain Soviet military spending in 1983 at the absolute 1982 level, although, of course, it would be preferable to reassign if only some of these resources to the peaceful sections of the economy, where there is a very great need for expanded investment. Unfortunately, such an opportunity is at the present time lacking. It is ruled out by the imperialist policy of arms race with the candidly proclaimed purpose of securing military superiority and at the same time achieving the "economic exhaustion" of the socialist and other peace-loving states. [Ref. 60: p. 11]

From this statement it is obvious that Soviet leaders will continue with their military buildup at the expense of the consumer sector. In doing so, they will continue to tax what is seen as an already overburdened system, with military spending between 12 and 16 percent of the GNP.

C. EXTERNAL TRADE RESTRAINTS

The major hard currency sales of the Soviet Union have been energy, military arms, and gold. Price increases of these items will, in all likelihood, be modest from the mid-1980's into the 1990's. In 1983, there was a 15 percent decline in the world price of oil, and this market has remained relatively stable. In 1984, Soviet oil production fell for the first time since WWII, and some experts see this trend continuing into the 1990's. To maintain hard currency imports, the Soviets have, in the past, increased their exports of oil and natural gas. In the immediate future, this may no longer be an option available to Soviet leaders. [Ref. 61: p. 52] Reduced oil prices will also restrict the purchase of Soviet military hardware by Middle East oil-producing countries. Additionally, the price of gold has generally moved with inflation. When inflation rises, so does the price of gold; when inflation falls, the price of gold has also decreased. Since many countries are coming to grips with their inflation problems, it is most probable that the price of gold will remain relatively constant into the next decade. Thus, Soviet earnings from the sale of gold will remain at their present rate, or decrease slightly. The future is less than promising in all three major areas of hard currency export. [Ref. 62: pp. 57-58]

D. PROJECTION OF SOVIET WORLD TRADE

It is most likely that these restraints on the Soviet Union will serve to reduce the volume of East-West trade through the 1980's and into the 1990's. At the same time, Soviet Third World trade, particularly trade with grain and oil-producing Third World countries, will continue to increase. The striking inevitability of direct U.S.-Soviet economic competition for the natural resources of the Third World is at hand. The economic war Soviet Premier Khrushchev called for will be fought in the Third World. The expansive nature of the Soviet military machine and their ability to use the force of proxies suggests that the fight may not remain purely economic.

E. UNITED STATES POLICY OPTIONS

By definition, economics is an integral part of strategy in both war and peace. Yet a long range, consistent, and effective United States trade policy vis-a-vis the Soviet Union and the Communist bloc has not been developed. The formation of a policy to deal with the economic intrusion of the Communist bloc into world trade requires a consensus on the effects of such trade. This consensus must be preceeded by a consensus on the Soviet threat in general.

In view of the diversity of opinions on the Soviet threat within the United States, the industrial West, let alone the Third World, such agreement is unlikely. Without the agreement and cooperation of other world leaders,

options for U.S. policymakers are limited. Unilateral economic sanctions by the United States aimed at the Soviet Union have proven ineffective. Almost any product supplied to the Soviets by the United States can be obtained from other sources: technology from West Germany, France, Japan, etc.; and grain from Canada, Australia, Argentina, and Brazil. The interdependent nature of trade additionally requires an accurate assessment of the domestic consequences of trade limitation, as well as an analysis of the obtainable goals of any proposed restrictions.

With these limitations, the best United States policymakers can strive for is agreement within the industrial West to restrict, from the Soviet Union, emerging technology with close military application and favorable credit arrangements.

APPENDIX A

COLLAPSE OF THE CAUCASUS OILFIELDS--1920

(extracted from Antony C. Sutton, Western Technology and Soviet Economic Development 1917-1930, pp. 16-17)

The Caucasus oilfields are a major segment of Russian natural resource wealth. Baku, the most important field, was developed in the 1870's. In 1900 it was producing more crude oil than the United States, and in 1901, more than half of the total world crude output. The Caucasus oilfields survived the Revolution and Intervention without major structural damage and became a significant factor in Soviet economic recovery, generating about 20 percent of all exports by value, the largest single source of foreign exchange.

Caucasian fields require continuous drilling to maintain an oil flow from producing wells. Therefore, oil production in this area is directly proportionate to the amount of drilling undertaken. Before the Revolution, drilling averaged in excess of 35,000 feet per month, and had been as high as 50,000 feet in Baku alone.

The Bolsheviks took over the Caucasus in 1920-21, and until 1923, oilfield drilling almost ceased. During the first year of Soviet rule, "...not one single new well has started giving oil," and even two years after Soviet occupation, no new oilfield properties had been developed. In addition, deepening of old wells virtually ceased. As a result, water percolated into the wells, and the flow of crude oil became first a mixture of oil and water, and finally a flow of oily water.

AVERAGE MONTHLY DRILLING IN RUSSIAN OILFIELDS, 1900-1921

1900	1913	1920	1921
48,496 ft.*	36,665 ft.	720 ft.	Jan. 336 ft.*
			Feb. 406 ft.*

*Baku only

Drilling records are an excellent indicator of the state of oilfield maintenance, development, and production. The complete collapse after the Soviet takeover is clearly suggested in the above table. In 1900, Russia had been the world's largest producer and exporter of crude oil; almost 50,000 feet of drilling per month had been required of Baku alone to maintain this production. By early 1921, the average monthly drilling in Baku alone had declined to an insignificant 370 feet or so (0.7 percent of the 1900 rate), although 162 rigs were in working order. This drilling was concentrated in only eight holes due to lack of steel pipe.

The result was that by 1922, half of the Baku wells were idle, and the remainder were producing increasing quantities of water. In the Grozny field, a greater portion of the wells were idle; only eight were in process of drilling, and the Old Grozny section was completely shut down. Smaller fields at Emba and Kuban were in similar chaos; both had received extensive drilling in 1915; consequently, there were 40 to 50 producing wells in 1922, but no new or maintenance drilling was in progress.

The reasons for the catastrophic decline in oilfield production were four. First, the number of available oilfield workers declined from about 40,000 in 1915, to less than 10,000 in 1920-21; coupled with this was the growing technical inefficiency of the remaining workers. Second, there was a breakdown in railroad transportation, and a decline in pipeline capacity because of lack of maintenance. Third, new oilfield supplies and equipment, including repair facilities, were almost nonexistent. Last, there was a breakdown in the oilfield electrical supply system. One of the largest Baku powerhouses, for example, had 22 watertube boilers; none were in operation in 1922.

APPENDIX B

EUROPEAN COMMUNITY NOTE ON PIPELINE EQUIPMENT EMBARGO

(Text of the European Community Protest Note of 12 August 1982 to the U.S. State and Commerce Departments on the Export Administration Regulations Issued by the United States on 22 June, Affecting Equipment for the Soviet Gas Pipeline.)

Source: Charles Maechling, Jr., "Arguments Against the Pipeline Embargo," Europe, September/October, 1982, p. 6.

The European Community wishes to draw attention to the importance that it attaches to the legal, political, and economic aspects of the United States' measures, including their impact on the commercial policy of the Community. As to the legal aspects, the European Community considers the U.S. measures contrary to international law, and apparently at variance with rules and principles laid down in U.S. law.

As to the political and economic aspects, it is clear that the U.S. measures are liable to affect a wide variety of business activities while their primary purpose is to delay the construction of the pipeline to bring Soviet gas to Western Europe. The European Community holds that it is unlikely that the U.S. measures will in fact delay materially the construction of the pipeline or the delivery of the gas.

The pipeline from Siberia to Western Europe can be completed using Soviet technology and production capacity diverted from other parts of their current program. Furthermore, the recent U.S. measures provide the Soviets with a strong inducement to enlarge their own manufacturing capacity and to accelerate their own turbine and compressor developments, thus becoming independent of Western sources. Gas could still flow to the Community starting as scheduled in 1984 owing to the existing pipeline system, sufficient to cover the requirements of the early phases of the delivery program.

One of the main elements of the Community's policy of reducing the vulnerability of its energy supply is based on diversification of sources. Gas from the Soviet Union will help to conserve the Community's own stock of gas, oil, and other fuels, and will reduce the Community's reliance on

dangerous dependence on that source. Even when gas is flowing at the maximum rate, in 1990, it will represent less than that four percent of the Community's total energy consumption.

Whatever the effects on the Soviet Union, the effects on European Community interests of the U.S. measures, applied retroactively and without sufficient consultation, are unquestionably and seriously damaging. Many companies interested as subcontractors, or suppliers of components, have made investments and committed productive capacities to the pipeline project, well before the American measures were taken. Though they may use no American technology, they will suffer complete loss of business if the European contribution to the project is blocked. Some of these companies may not survive. Major European companies that can survive the immediate loss of business, will, nevertheless, suffer from lower levels of capacity utilization and loss of production and profits, while workers will be laid off temporarily or permanently.

In the longer term, the European Community companies may be damaged by the disruption of their contracts concluded in good faith, because they may cease to be reliable suppliers in the eyes not only of the Soviet Union, but also of their actual and potential business partners in other countries. One inevitable consequence would be to call in question the usefulness of technological links between European and American firms, if contracts could be nullified at any time by decision of the U.S. administration. Another consequence to be feared is that the claim of U.S. jurisdiction accompanying U.S. investment will create a resistance abroad to the flow of U.S. investment. Thus, these export control measures run counter to the policy aims of the United States of easing the transfer of technology and of encouraging free trade in general. There will be other far-reaching effects upon business confidence. These measures thus add to the climate of uncertainty that is already pervading the world economy as a whole.

The European Community therefore calls upon the United States authorities to withdraw these measures.

APPENDIX C

ILLEGAL TECHNOLOGY TRANSFER CASE STUDIES

Source: U.S., Congress, Senate, Committee on Governmental Affairs, "Transfer of United States High Technology to the Soviet Union and Soviet Bloc Nations," November 1982, pp. 12-23.

CASE NO. 1: HOW SOVIETS EQUIPPED SEMI-CONDUCTOR PLANT WITH U.S. MACHINERY

The CTC-Maluta case came about when a syndicate of electronics companies was set up in Western Europe and Southern California by a 34-year-old West German named Werner J. Bruchhausen. Several of Bruchhausen's Southern California enterprises had the initials CTC, and all were managed by his principal American accomplice, Anatoli Maluta, also known as Tony Metz, a Russian-born naturalized American citizen.

Using Burchhausen's companies and accomplices in Western Europe as freight forwarders and transshipment points, Maluta sent more than $10 million in American-made high technology equipment to the Soviet Union from 1977 to 1980. Much of the machinery was used to equip a Soviet plant for the manufacture and testing of semi-conductors. The equipment went from California to Western Europe to the USSR.

To Dr. Baker, the CTC-Maluta case proved his point that the Soviets know precisely what U.S. technology they want; they leave little to chance, Dr. Baker said, explaining:

> Of particular interest to me in the (CTC-Maluta) case is the information it gives us about Soviet intentions. We delude ourselves if we think the Soviets enter the black market in search of strategic components in a helter-skelter style, buying up dual-use commodities without rhyme or reason.
>
> The truth of the matter is that the Soviets and their surrogates buy nothing they don't have specific, well-defined needs for. They know exactly what they want--right down to the model number--and what they want is part of a carefully crafted design.

The carefully crafted design in this instance, Dr. Baker said, was the semi-conductor manufacturing plant, an essential part of the Soviets' desire to close the technical gap between themselves and the U.S. in the intergrated circuit/micro-computor industry.

Dr. Baker, who testified in the 1981 successful prosecution of Maluta and his associate, Sabrina Dorn Tittel, said he studied 400 separate air waybills and other shipping documents used by the CTC network. He said the conclusion was inescapable that the Soviets were equipping a semi-conductor plant. He said the Soviets' use of components of U.S. origin demonstrated their determination to make the facility as efficient and modern as any in the world. He explained:

> ....(the Soviets) have purchased clandestinely all the hardware they need for equipping a good intergrating circuit production plant. They showed no interest in purchasing production equipment that was not state-of the-art. They showed very good taste.

Stressing his point that, through the CTC-Maluta combine, the Soviets bought everything they needed for a semi-conductor manufacturing plant, Dr. Baker testified that among the equipment they bought over the period 1977 through 1980 were saws for cutting silicon crystals, equipment for making masks for intergrated circuit design, diffusion ovens for circuit production-implantation systems for circuit production, photolithographic systems for intergrated circuit production, scribers for separating intergrated circuits on wafers, testers for testing intergrated circuits on wafers, bonding equipment for bonding connecting leads to intergrated circuits, and packaging equipment for packing the circuits. Dr. Baker went on to say:

> High quality for intergrated circuits are the basis of modern military electronics. Intergrated circuits form the basis for military systems which are more flexible, more capable, and more reliable than systems using discrete electronic components. The production tooling and equipment obtained by the Soviets (from the CTC-Maluta network) will significantly improve the Soviets' capability to produce such circuits.

Further support for the assertion that the Soviets relied on American technology for equipping of their semi-conductor plant came from John D. Marshall, a chemist and specialist in the operation of facilities that manufacture semi-conductors.

Marshall, who owns a high-technology business in that section of Santa Clara County, California known as the

Silicon Valley, testified that in the winter of 1975 he made two trips to the Soviet Union.

Led by a West German named Richard Mueller to believe that the Soviets wanted to retain his consultative services in connection with their plans to manufacture electronic watches, Marshall learned on his second trip to Moscow that what was actually desired of him was his expertise in equipping a semi-conductor plant. Marshall told the Subcommittee:

> On the second trip, we met several Soviets who purported to be technical people. They were not very well-trained, and were not familiar with sophisticated technological thinking. But it was apparent to me by the questions they asked and the subjects they discussed that the Soviets had built a semi-conductor manufacturing and assembly plant and they were anxious to equip it.
>
> They wanted American semi-conductor manufacturing equipment, and they had detailed literature on the precise kind of equipment they wanted. They also wanted me to obtain for them certain semi-conductor components.
>
> It was clear to me that Mueller had deceived me as to the Soviets' intentions; that it was not merely electronic watches the Soviets wanted to manufacture.

Marshall said he realized that for him to cooperate any further with the Soviets would have constituted questionable or illegal conduct on his part. He said he refused to meet further with the Soviets and left Moscow.

As he returned to the United States, Marshall began to recall recent conversations he had overheard that at the time had not made sense to him, but now were becoming clear. Traveling to Moscow, for example, Marshall and Mueller had stopped over in Hamburg where Mueller introduced him to a Canadian, whose name he could not remember, who made remarks to the effect that he also was providing technical assistance to the Soviets; that his mission was to show them how to make intergrated circuits, and how to use properly equipment they would be obtaining.

In Moscow, Marshall said, he met a woman who spoke English with a German accent, who was planning to ship certain American-made photolithography materials to the Soviet Union via East Berlin. Photolithography materials are critical in semi-conductor manufacture. Marshall could not remember the woman's name.

The significance of 1975 as being the year in which the Soviets expressed their desire for American-made semi-conductor equipment was explained by Marshall. He said in 1975 the U.S. was preeminent in the field of semi-conductor technology. He said:

> It is my view that the Soviets had built their manufacturing plant, or plants, to specifications for American-made equipment--for the manufacture, assembly, and testing of intergrated circuits. Now that the facilities were constructed, they were in the winter of 1975, confronted with the next step, which was to equip the facilities.

Marshall said that the Soviets' primary interest in equipment in 1975 related to the manufacture and assembly phase of semi-conductor production. By 1977, he said the Soviets would have been ready to stock the facility with the test equipment; with software development equipment.

Dr. Lara Baker, in his testimony before the Subcommittee, said his knowledge of the sequence of events in the purchase of the semi-conductor equipment squared with Marshall's. In the 1978-79 timeframe, Dr. Baker said the CTC-Maluta syndicate was purchasing production equipment. In the 1979-80 period, the CTC-Maluta network was buying semi-conductor test equipment. Marshall's testimony "is quite consistent with my information," Dr. Baker said.

CASE NO. 2: POLISH SPIES COMPROMISED RADAR EXPERT WILLIAM HOLDEN BELL

The Subcommittee examined the William Holden Bell/Marian Zacharski case as an instance in which Soviet bloc spies, working out of a Polish-owned company in the United States, cultivated and then compromised an American defense industry engineer, and obtained from him significant amounts of secret military information.

Burdened with debts and back taxes, family tragedy, and a job with no future, William Holden Bell needed a friend. Bell, a 60-year-old Hughes Aircraft radar engineer, found such a companion in 30-year-old Marian Zacharski, who lived near Bell and his young Belgian wife, Rita, in the Cross Creek Village apartment complex in Playa del Ray in Los Angeles Country.

Testifying before the Subcommittee, Bell said he knew Zacharski to be a Polish national, and the West Coast manager of the Polish-owned machine manufacturing firm, Polamco,

incorporated in Delaware and Illinois, with offices in Chicago, Detroit, and Los Angeles. But, Bell said, he was not concerned about the national security problem in his association with Zacharski, believing that the Soviet bloc spies sought to inject themselves into the lives of defense industry engineers like himself only in Europe and other foreign places. "When you are sent to Europe, you are told to expect attempts by foreign spies," Bell testified, "but whoever expected it to happen here at home?"

Bell and Zacharski played tennis on a daily basis. With their wives, they met socially. Zacharski "slowly became my best friend," Bell recalled, noting also that the Polish manufacturing executive had a liberal expense account and used it generously. Bell said Zacharski asked him to make a few contacts for Polamo sales. Bell did, and without advance notice, Zacharski paid him $4,000. In addition, Zacharski told Bell he might be needed as a consultant for Polamco once he retired from Hughes.

Looking toward further employment with Polamco, Bell said he tried to demonstrate to Zacharski his own professional competence, and showed him a document he had prepared at Hughes Aircraft on a sensitive military subject. Bell said the document was classified secret, and that though he gave it Zacharski on the tennis court, his Polish friend took it home to read.

At this stage of his relationship with Zacharski, Bell said, he justified his own conduct on the theory that Polamco was just like any other industrial company in the United States which used gratuities and other forms of payoffs to obtain company secrets from competitors. Bell explained:

> An engineer for one company is interviewed by the management of another. Considerable benefits are dangled in front of the engineer in terms of increased earnings and better positions. He is asked to produce samples of his work, and this is normally done without regard to their security classification. Sometimes the engineer is hired. More often he is not. This is generally tolerated because, of course, both companies are American. And they are in competition with each other.

Bells's initial perception of Zacharski as just another foreign business executive was enhanced, he said, by the fact that Zacharski, by virtue of his Polamco credentials, had access to government facilities, such as atomic energy installations and naval shipyards.

Under the pretense of helping Bell buy his apartment in the complex that was being converted indo condominiums,

Zacharski began giving cash payments to the Hughes engineer. Bell testified:

> In view of my prospective employment by Polamco, he (Zacharski) thought he could help me. Subsequently, he appeared at my door handing me envelopes of cash. With this money I made the downpayment on the condominium and paid the Internal Revenue Service. I signed a receipt for the money and concealed the source from my wife.

Bell began photographing sensitive documents he brought home from Hughes. He went to Inssburck, Austria, and met with more Polish agents. His expenses on this trip, and three others--to Insbruck again, to Lintz, and to Geneva--were paid by Zacharski. The agents were not guessing about Bell's worth to them, Bell said, explaining: "They knew exactly what they wanted, right down to the company identification numbers."

Before he was arrested by the Federal Bureau of Investigation, Bell had received a total of $110,000 over the 3-year period from 1977 to 1980. The CIA report to April 1982 entitled, "Soviet Acquisition of Western Technology," received as Exhibit No. 1 at the hearings, said that Bell gave the Polish agents more than 20 highly classified reports on advanced future United States weapons systems. The CIA said the Polish government "probably" gave the reports to the Soviet Union.

The CIA said that among the classified reports Bell turned over to the Polish spies, those of prime importance to the United States included: The F-15 Look-Down/Shoot-Down radar system, the quiet radar system for the B-1 and Stealth bombers, an all-weather radar system for tanks, an experimental radar system for the U.S. Navy, the Phoenix air-to-air missile, a towed-array submarine sonar system, a new air-to-air missile, the improved HAWK surface--to-air missile and a NATO air-defense system. The CIA went on to say:

> The information in these documents put in jeopardy existing weapons and advanced further weapons systems of the United States and its Allies, The acquisition of this information will save the Polish and Soviet Governments hundreds of millions of dollars in R&D efforts by permitting them to implement proven designs developed by the United States and by fielding operational counterpart systems in a much shorter time period. Specifications on current and further U.S. weapons systems will enable them to develop defense countermeasures.

Bell, convicted of espionage and serving an eight-year prison sentence, blamed no one but himself for his conduct, but he did say that a more effective internal security system at Hughes Aircraft might have pinpointed him as a potential security risk. He said it was well-known among his coworkers in the office that his finances were in disarray, that he was being pursued by the IRS, and that he had filed for bankruptcy. It also was apparent that he might have harbored deeply felt resentment against the company for which he had worked for 30 years, but which, at this late date in his career, had "shunted (me) off to a guiet back room." Bell said his own security clearance with Hughes had not been reviewed in 28 years. Moreover, Marian Zacharski and his firm, Polamco, were known to the FBI, and his association with Bell should have triggered more interest, Bell said.

Bell said FBI agents told him that Marion Zacharski was known by national security authorities to be a "highly trained Polish intelligence officer" when he came to the U.S. in 1977. Zacharski was placed under surveillance "the day he arrived in the United States, and when he arrived in California, he was under continuous surveillance there," Bell said.

Convicted of espionage, Zacharski was given a life sentence.

APPENDIX D

SOVIET FOREIGN TRADE 1983

(in rubles)

		1982	1983
Total	turnover	119576,1	127473,1
	export	63165,1	67887,7
	import	56411,0	59585,4
Afghanistan	turnover	691,0	675,2
	export	412,5	401,o
	import	287,5	274,2
Bangladesh	turnover	54,9	83,7
	export	27,6	50,1
	import	27,3	33,6
Vietnam	turnover	1010,7	1139,0
	export	804,2	904,1
	import	206,5	234,9
India	turnover	2514,0	2332,6
	export	1040,2	1271,6
	import	1473,8	1051,0
Indonesia	turnover	53,8	53,8
	export	34,4	22,2
	import	19,4	36,1
Jordan	turnover	90,7	68,0
	export	90,5	67,6
	import	0,2	0,3
Iraq	turnover	994,1	753,9
	export	975,9	371,4
	import	18,2	382,5
Iran	turnover	766,0	936,5
	export	577,3	599,2
	import	188,7	377,3
Yemen Arab Republic	turnover	34,4	41,8
	export	34,1	41,7
	import	o,3	o,1

People's Dem Rep of Yemen	turnover	73,0	141,0
	export	67,1	136,0
	import	5,9	5,0
Philippines	turnover	93,6	60,6
	export	13,1	5,6
	import	80,5	55,0
Sri Lanka	turnover	21,1	38,7
	export	3,1	3,0
	import	19,0	35,7
Japan	turnover	3682,4	3000,5
	export	756,6	825,o
	import	2025,8	217r,5
Laos	turnover	66,2	77,8
	export	64,2	75,5
	import	2,0	2,3
Saudi Arabia	turnover	14,3	169,4
	export	14,3	12,9
	import	-	156,5
Thailand	turnover	141,8	62,5
	export	8,9	7,8
	import	132,9	54,7
Sudan	turnover	9,2	35,5
	export	0,4	0,8
	import	8,8	34,7
Angola	turnover	64,4	173,1
	export	61,0	170,3
	import	3,4	2,8
Egypt	turnover	520,7	612,3
	export	218,6	255,3
	import	302,1	357,0
Libya	turnover	1346,0	1277,9
	export	221,1	264,1
	import	1125,8	1013,7
Morocco	turnover	194,7	152,8
	export	136,1	121,6
	import	58,6	31,2
Mozambique	turnover	50,0	77,8
	export	44,2	77,0
	import	6,7	0,8

Cuba	turnover	5840,5	6093,2
	export	3131,4	3399,9
	import	2709,1	2693,3
Nicaragua	turnover	42,5	51,9
	export	36,6	42,4
	import	t,9	9,5
Argentina	turnover	1292,0	1325,5
	export	27,5	25,9
	import	1265,4	1299,6
Brazil	turnover	595,4	697,4
	export	179,9	106,8
	import	415,5	590,6
United States	turnover	2243,2	1900,5
	exports	154,8	330,5
	imports	2088,4	1570,0

Source: FBIS, USSR Report, "International Economic Relations," 3 May 1984, pp, 12-14.

APPENDIX E

TYPICAL SOVIET/THIRD WORLD ECONOMIC AND MILITARY AID

(The following has been adapted from John L. Scherer, ed., USSR Facts & Figures Annual, Vol. B, pp. 194-204.)

Soviet Economic Assistance to Eastern Europe (mn $)

Year	Total Assistance	Total Implicit Subsidies	Oil Price Subsidy	Trade Surpluses
1978	3,875	3,725	1,600	150
1979	7,500	6,600	3,800	900
1980	18,100	16,500	10,200	1,600
1981	20,400	16,000	9,800	4,400
1982	15,250	12,500	6,300	2,750

Source: CIA-DIA Estimates. U.S., Congress, Joint Economic Committee, "Allocation of Resources in the Soviet Union and China." (Mimeo, 1983), DIA, 46.

TYPICAL SOVIET THIRD WORLD ECONOMIC AID

--Algeria: The Soviet Union and Algeria signed an economic protocol in March 1983. It may lead to the construction of three rolling mills, cement plants, the working of several mineral deposits, and the construction of railways and pipelines.

--Argentina: The Salto Grande hydroelectric power station with a capacity of 1.89 MW has gone into operation. Plants in Leningrad and Karkov supplied the generators, turbines and regulators.

--Bangladesh: The third unit of the Gorsal thermal power station (210,000 kw) will be commissioned at the end of 1984. The fourth will be commissioned in 1987, bringing the station to its designed capacity of 530,000 kw.

-Brazil: The USSR helped design and construct the Sobradinho hydroper station. It began operation in 1982, using six Soviet generators.

--Cuba: The USSR and Cuba have signed a protocol for the extraction of oil from Varadero-Cardenas and Galiano-Matanzas. The U.S. Department of State has estimated that the USSR gave Cuba $4.7 billion in economic aid in 1982, and $25 billion over the past seven years.

--Egypt: More than 100 Soviet experts are working in Hulwan, Naji Hammadi, and at the cement factory in Asyut. Specialists were to do maintenance work on electric power station turbines at Aswan in April 1983. There are currently 15 projects of bilateral cooperation.

--Grenada: About 12 Soviet science teachers arrived in Grenada in September 1983. Some 400 to 600 technicians were working on the island. Many were building a new international airport. A ground station in the Intersputnik network was to be constructed.

--India: The USSR and India signed a protocol 13 June 1983 to expand oil cooperation. The Soviets will send additional teams to carry out seismic surveys in the Cambay offshore area and the West Bengal State. They will determine whether surveys should be conducted in southern India's Cauveryhore Basin and the Himalayan hills. Seismic surveys will be made in Tripura. Two Soviet teams have put six oil wells and one gas well back in operation in Gujarat. India denied a report in the Hindustan Times of a secret delivery of Soviet uranium to Delhi in May, 1983 for the Rajasthan AES at Kota. India receives heavy water under the 1976 agreement. the USSR is to supply 256 tons of heavy water. About 131 tons had arrived by the end of 1982. About 400 Indian technicians have been trained in the Soviet Union, and almost 5,000 at their work places by Soviets. The USSR and India signed a protocol in September, 1983 to blast hills in the Singrauli coal field in Madhya Pradesh. A plan to develop the Godavari coal field will be prepared.

--Iran: More than 3,000 Soviet technicians have been involved in economic projects since 1981. Nineteen railway crews with locomotives control Iranian transport. Some 30 KGB officers train Savama agents, the Iranian secret police. Business Week (15 Aug 1983), p. 46, reports that more than 50 percent of the Soviet personnel in some projects are KGB operatives. Some 100 industrial, agricultural and other units are currently being built with Soviet assistance.

--Iraq: The Hadita hydroelectric power station (570 MW) is under construction. Stations built with Soviet assistance account for more than 25 percent of Iraq's total electricity. These stations are Badjibija (thermal, 200 MW), Nasiriya (thermal, 840 MW), and Dokan (hydro, 400 MW).

--Libya: Work on the gas pipeline from Al-Buraythah to Misureta is nearly completed. An iron and steel complex will be guilt at Misureta. In 1981, Soviet specialists prepared a soil map for an area of about 3.5 million hectares. The Soviets have been invited to participate in a water diversion project involving subterranean water from the inland regions.

--Madagascar: A 255-km highway from Ambetabe through Mahanoro to Marolambo is planned.

--Mongolia: The USSR has helped Mongolia build a radio relay line over 2,000-km long from Ulaanbaatar westward. Another line will be built to the east. The Erdenet copper mining and concentrator project has been commissioned ahead of schedule.

--Nicaragua: Two hydraulic engineering schemes are being designed by the Soviets for Nicaragua. Bulgaria and the Soviet Union are helping build a port, a drydock, and a satellite station. A deep-water port at El Bluff at the entrance to Bluefields Bay would end Nicaragua's dependence on the Panama Canal. The $125 million El Bluff project would move goods by river to Rama, 35 miles from the port, then by roads inland. The Soviets will put a drydock at San Juan del Sur, the Pacific port to be used for the tuna fleet. A satellite telecommunications station is planned outside Managua. The USSR will help Nicaragua for at least seven years.

--Nigeria: The first phase of the Ajokuta Metallurgical Plant, the largest in tropical Africa, was commissioned in July 1983. It has a basic oxygen furnace, but Nigeria lacks good coking coal for the furnace.

--North Korea: A cold-rolling shop was commissioned at the Kim Chaek Metallurgical Combine at Chongjin in early 1983. An oxygen converter and a hot-rolling shop have already been constructed under an agreement to increase the capacity of the plant by 1 million tons of steel.

--Peru: Soviet experts helped design the Olmos hydropower and irrigation system. The design incorporated a provision to divert the flow of rivers from the Atlantic to the Pacific side of the Andes through a 20-km tunnel. Approaches to power engineering have changed frequently in Latin America, according to the Soviets, and these changes have delayed cooperation.

--Syria: The USSR and Syria signed a protocol 23 May 1983 to develop Syria's first nuclear power station. The protocol includes plans for geological testing and the construction of a 220 kV high-tension line. The Hims-Damascus railroad became operational in March. Moscow and Damascus signed an agreement in 1983 to build a railway between Al Ladhiqiyah and the port of Tartus.

--Turkey: An economic commission meeting in June 1983 discussed possible Soviet help in constructing a nuclear energy facility and Soviet trucks in Turkey under a license agreement. A gas pipeline from Yeletz, south of Moscow, across Romania and Bulgaria, and into Turkey, built at Soviet expense, was discussed.

--Vietnam: Soviet economic aid to Vietnam was about $950 million in 1982. East bloc countries contributed another $500 million. There are currently some 10,000 Soviet diplomats, military advisors, and technical experts in the country, including 500 to 600 in Vung Tau looking for petroleum. The Bach Ho structure is also being explored. Vietnam's first offshore oil well was to be drilled by Azeris from Baku. The Australian Age (13 Jun 1983) reported that Moscow has sent about $5 billion in economic aid, and 3,750 technical advisors to Vietnam, Kampuchea, and Laos in the last seven years. Since 1979, it has supplied over $2 billion in military assistance, and 2,500 military advisors. The Black (Da) River was dammed in January 1983 to build a 1,920-MW hydropower station. The Far Eastern Economic Review (17 Nov 1983), p. 47, notes that Moscow has trained 60,000 Vietnamese technicians and workers and nearly 400,000 students from Vietnam have been educated in the USSR during the past 30 years. This is probably a typographical error for 40,000 students.

TYPICAL SOVIET MILITARY AID TO THIRD WORLD COUNTRIES

--Argentina: The Argentines used Soviet-made Strela (SAM-7) antiaircraft weapons during the Falklands War in 1982. The weapon was not particularly effective. MIG sales to Argentina were discussed in 1983.

--Cuba: Soviet arms deliveries to Cuba totaled about 63,000 tons in 1981, the highest amount since 1962. Deliveries reached 68,000 tons, worth $1 billion, in 1982. The number of military advisors rose 20 percent to 2,500. Cuba obtained 140 SAM-3 Goa missiles in December, 1982. They have a maximum range of 25 miles, and an envelope to 49,000 feet. Two to three MIG's were also sent late in the year.

--Ethiopia: The USSR requested at least some payment for the $2 billion loan to buy arms when Mengistu Haile-Mariam visited the Soviet Union in 1982. Mengistu reportedly told Moscow his country could pay nothing.

--Grenada: U.S. troops discovered a secret treaty dated 9 February 1981 between the USSR and Grenada during the October invasion of the island. The treaty was to provide

without charge some $37 million in military equipment to Grenada, $25 million from the USSR, and $12 million from North Korea. Deliveries from the USSR during 1981-83 were to involve 4,000 submachine guns, 2,500 rifles, 7,000 mines, 15,000 grenades, and 60 armored personnel carriers. The North Korean treaty dated 14 April 1983 would provide 1,000 automatic rifles with 360,000 rounds of ammunition, 50 light machine guns, 30 heavy machine guns with 60,000 rounds of ammunition, 50 ricket-propelled grenade launchers with 500 rounds, 200 hand grenades, two coast guard boats, 6,000 uniforms and other equipment. The materiel from the USSR is listed in the New York Times (7 Nov 1983), p. 10. On 4 November 1983, 126 occupants of the Soviet Embassy on Grenada left the island, including 49 Soviets, 53 Cubans, and 15 North Koreans.

--India: India is buying Soviet arms under a two-billion ruble loan repayable in 20 years at 2.5 percent interest. The Indians will manufacture the new MIG-27 in the near future. The MIG-27 costs approximately $8 million, compared to the Mirage-2000, which India will also purchase for $30-65 million each. Moscow has offered New Delhi its MIG-31, which is still under development. New Delhi has agreed to buy the AN-32 medium tactical transport plane. Machinery to assemble the MIG-27's was installed at the Hindustan Aeronautics Ltc. factory at Nasik. About 200 will be assembled in India, the first beginning in April, 1984. Indian newspapers reported in July 1983 that the Soviets had delivered T-72 tanks with a laser rangefinder. The Soviets agreed in January 1983 to deliver an undisclosed number of BMP's with Saggers.

--Iran: The Soviets are rebuilding a naval base at Chah Bahar, and an airbase at Konarak at the entrance to the Persian Gulf.

--Iraq: Iraq currently receives less than 66 percent of its military equipment from the USSR compared to 95 percent in 1972. France has become a major supplier. Two Soviet ships off-loaded arms for Iraq at the Kuwaiti port of Shuiba on 20 and 27 May 1983. The weapons included artillery shells, bombs, and missiles. The Christian Science Monitor (28 Mar 1983), p. 6, reported that at least one Iraqi brigade had been equipped with T-76 tanks. This might have been a misprint for T-72's, or a prototype of the T-80.

--Libya: Italian jets intercepted two TU-22's being ferried from the USSR to Libya as they approached Italian airspace on 20 September 1983. Khadafy signed his first major arms deal with the Soviets in 1974 for $2.3 billion. Other agreements were concluded in 1977, 1978, and 1980. The value of the 1980 deal may have been $8 billion. The U.S. Department of

State estimates the total value of Soviet and East European arms agreements with Libya at $28 billion, with another being negotiated for several billion.

--Nicaragua: Thirty-six military bases are under construction or recently have been completed. The USSR has sent 50 tanks, and East Germany has delivered 1,000 trucks. Nicaragua has received 100 antiaircraft guns, three brigades of Soviet artillery, and Soviet assault helicopters and transport aircraft. In August 1983, the Aleksandr Ulianov brough military equipment, including at least two helicopters, to Nicaragua. The Soviet increased the number of their advisors in Nicaragua from 70 to 100. About 70 Nicaraguan pilots were trained in Bulgaria in December 1982, and 30 stopped in Cuba on the way home to continue training. Five Nicaraguan pilots were studying in the USSR, where they were learning to fly the MIG-21 fighter. The Soviets delivered several AN-16 transport and MI-8 helicopters to Nicaragua in 1983. They have also provided 16 naval patrol boats. In the past two years, Nicaragua has obtained 60 tanks, several dozen APC's and armored reconnaissance vehicles, over 1,000 East German trucks, 122mm and 155mm field artillery, BM-21 rocket launchers, and 100 anti-aircraft guns.

--South Yemen: By 1984 the South Yemeni Army will have increased 40 percent to 50,000 troops. T-62's and early model T-72's will replace older models, and may rise from 450 to about 700. The Air Force has a dozen MIG-23's and some MI-24 helicopters. About 1,500 Yemenis are being trained in the USSR and East Europe. The Army's 10 infantry brigades will get some APC's and self-propelled heavy guns. Foreign Report, #1788 (25 Aug 1983), p. 4.

--Syria: The Soviets introduced SA-5 SAM's into Syria in January 1983. Their range is about 155 miles. They had not been sent outside the USSR prior to this deployment. There are some 1,200 SA-5's in the Soviet Union. The 75 SA-5's cost an estimated $2 billion. Syrian President Hafez Assad said in October 1983 that Moscow and Baghdad were discussing the possibility of direct Soviet military assistance in event of an Israeli attack. The Soviet Union has provided a computerized control system for air defense that extends into Lebanon. It is linked by satellite to Moscow. The number of Soviet advisors in Syria has increased from 7,000 to 10,000. The SS-21 was introduced into Syria during 1983. Its range is about 120 km. There are currently six to nine of these missiles. The Syrians are increasing the number of SCUD-B missile launchers from 36 to 54. The USSR has provided about 160 fighter aircraft, including MIG-23's, for the 96 jets lost over the Bekaa Valley in 1982. Approximately 800 T-72 tanks have been added to Syrian forces. About 200 armored personnel carriers, and 600 to 800 trucks have also been provided.

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